A COMPARATIVE STUDY OF HEALTH STATUS, HEALTH BEHAVIORS, AND HEALTH CARE DELIVERY: THE UNITED STATES AND GREAT BRITAIN

By

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To my son,

Douglas Robert Mulle
(1969-1988)

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Using the U.S. Health Interview Survey, 1985 (a sample of 33,630 respondents surveyed in 1985) and the British Health and Lifestyle Survey 1984-1985 (a sample of 9,003 respondents surveyed in 1985), this study examined the relationships of socioeconomic status and health promotion behaviors to health status in both countries, and how those relationships differed according to system of health care delivery. The data sets were developed in each country for their respective national health departments. The relationships between socioeconomic status and health status were first examined separately, in order to determine within-country relationships, and then the relationships were compared across the societies. By examining the SES-health status relationships across the societies, it was found that this relationship was very similar in both countries, and that socioeconomic status was not the best predictor of high health status. In both countries, the health promotion behavior of participation in exercise was most significant in affecting positive health outcomes, both directly, and by mediating the negative effects of low socioeconomic status.

CHAPTER 1
INTRODUCTION

In 1990, it was estimated that 33 million citizens, or 15% of the population of the United States, had no health insurance (U.S. General Accounting Office [US GAO], 1991). This represents an increase of 50% of uninsured Americans in the 1980's over the previous decade (Waitzkin, 1989). Of these 33 million Americans who have no health insurance, the poor are disproportionately represented. Thirty-four percent of the poor (living at or below the poverty level) have no health insurance (US GAO, 1991). Often, lack of medical insurance means lack of medical care. In a nation where access to vital health care services and the quality of that care depend largely on the ability to pay, health care has become more of a privilege than a right of citizenship. According to the dominant values in America today, medical care is largely a market commodity where the ability to secure medical care is determined by the ability to purchase that care. As a result, the way in which health care is delivered has created a system which is class biased.

In the U.S., the middle and upper classes maintain the highest levels of health (Cockerham et al., 1986). That this relationship between social class and health status persists today is contrary to what might be expected in light of several major changes which have occurred during the last 40 years. Infectious diseases have declined as a major cause of mortality. Adequate nutrition, housing, water, and sanitary conditions have become available to most Americans. In 1966 Medicare and Medicaid were created, which were designed to place medical care within reach of the poor. Yet, in spite of these developments, there still exist socioeconomic disparities in morbidity and mortality. Socioeconomic status (SES) continues to be linked to the risk of health and disease in America.

In order to address the problems created by a class-biased medical system, structural reform of the existing health care system in the U.S. has been suggested (Barber, 1991; Waitzkin, 1989; Williams, 1990). President Bill Clinton and Hillary Rodham Clinton are developing a plan for health care reform which will involve structural change of the present system. The plan will likely guarantee health care coverage for the estimated 33 million Americans who are uninsured, and a benefits package to cover doctor's and hospital's bills, prescription drugs and preventive care for those with insurance (Brink et al., 1993). The position for health care reform is based on the belief that universal entitlement to adequate health care is a basic human right, and if certain groups have poor health status for social or economic reasons, the health policy of the nation should address those issues. This system-barriers approach to structural reform focuses on the inadequacies of the present health care system: the scarcity of physicians in poverty areas, travel difficulties to access medical resources, and cost constraints (Dutton, 1986). It may be that the adoption of some form of a centralized national health program, with the provision of medical services by the state, would increase access to medical resources by all Americans. One such form of national health program is the National Health Service of Great Britain, which has been in existence since 1948.

Statement of the Problem

The fact that many Americans do not receive adequate health care due to a lack of financial resources to access the system is a major concern of policy makers and citizens in the U.S. today. Under the present professional fee-for-service health care delivery system in the U.S., those with the resources to purchase health care have good health and those who cannot have poorer health. The problem addressed by this research is whether a structurally different system of health care delivery, the National Health Service of Great Britain, would reduce the relationship between health status and socioeconomic status that is found in the U.S. today. The SES-health status relationship will be examined within each country, and then these relationships will be compared across countries. These analyses will be used to determine whether a structurally different system of health care delivery from the professional fee-for-service system of the U.S. might provide better health care to all Americans.

Discrepancies in Health Status Based on Social Class in the United States

The strong positive association between social class and health status has been observed by many researchers. In an early systematic review of health statistics and literature, Antonovsky (1967) found that the lower classes have invariably had lower life expectancies and higher death rates from all causes of death than those in the higher social classes. Kitagowa and Hauser (1973) conducted an exhaustive and detailed review of mortality differentials in the U.S. and found that lower socioeconomic groups have had higher death rates than those in the higher groups, whether income, education, or occupation was used as an indicator of SES. Recent studies have continued to support these early findings. Logue and Jarjoura (1990), for example, found that members of the lower classes experienced heart disease mortality rates significantly higher than those in the higher classes. Marmot and Theorell (1990) found higher mortality rates for members of the lower class for coronary heart disease, lung cancer, and cerebrovascular disease.

Dutton (1986) reported similar findings, as age-adjusted death rates from four of the five major causes of death (heart disease, cancers, strokes, and diabetes) in her review were higher among the poor than among other income groups.

Recent studies have focused on the infant mortality rate, which is considered one of the most sensitive indicators of the health of a society because it is the indicator most dependent on the social and economic well-being of mothers and children. The infant mortality rate is defined as the number of deaths of children under one year of age per 1,000 live births. Rates of infant mortality in the United States have followed the same pattern as overall mortality rates. Groups in the lower income areas, especially inner cities, have long been, and continue to be, characterized by infant mortality rates that are substantially above those in the higher income areas (Bodenheimer, 1989; Stockwell et al., 1988).

In regard to morbidity, income has also been found to have a strong influence on the occurrence of illness (Freund and McGuire, 1991; Hay, 1988; McLeod and Kessler, 1990; Santariano, 1986; Susser et al., 1985; Wescott, 1990), for all illnesses and for specific illnesses such as heart disease (Logue and Jarjoura, 1990). Rates of chronic illness have been found to be highest among the poor (Haan and Kaplan, 1986; Logue and Jarjoura, 1990). Rates of infectious disease, long thought controlled by our technologically advanced medical system, have been increasing among poor children (Bodenheimer, 1989).

The Health Care System of the United States

The medical system in the U.S. is best described as a professional model with an emphasis on fee-for-service and professional autonomy (Freidson, 1970). In this system, at least in its "ideal type" form, members of the health care professions (individual practitioners and health care facilities) are able to levy a charge for each service they perform. The amount charged is set by these members, taking into account market forces. The members of the health care profession enjoy socioeconomic and technical autonomy in their profession, free from lay interference. National, state, and local professional societies (e.g., the American Medical Association and American Hospital Association), constitute the basic, formal organizational framework within which the profession works. Criticism of the medical profession and of its lack of responsiveness to public interest is common (Cockerham et al., 1988; Navarro, 1986; Starr, 1982; Waitzkin, 1989). Two trends have been identified as especially problematic in relation to the delivery of health care: the steep decline in the number of physicians available to inner city and rural residents, and the growth of corporate medicine (Freund and McGuire, 1991), both of which affect ability to access the system.

Part of the problem is due to persistent patterns in the state-funded Medicaid program. Although Medicaid was designed to provide health insurance to the poor, it actually covers less than 60% of children who live below the poverty level (Harvey, 1990). While each state determines its own level of eligibility, not one of the 50 states has a level that is on a par with the federal poverty level.

The Health Care System of Great Britain: An Alternative to Fee-for-Service

The National Health Service of Great Britain is a highly centralized system of health care delivery which delivers medical services uniformly to all members of society, and quality of care is uniform across the society (Hollingsworth, 1981). Physicians are either employed by the local authority health service or are self-employed general practitioners who contract with the health service to provide primary care. The British hospital sector is nationalized; thus the government owns most hospitals. Regional variations in the number of physicians and in the distribution of hospital beds have significantly diminished (Hollingsworth, 1981). There is a small private sector in Great Britain, and the major advantage to the patient able to afford private insurance coverage is the opportunity to decrease waiting time for elective surgery. However, according to Gill (1990) "no one in Britain need be without medical care because of financial barriers" (p. 478).

The Proposed Research

The purpose of this research is to examine the relationship between socioeconomic status and health status by studying relationships: (1) within a country without a national health service, (2) within a country with a national health service, and (3) comparing the two. Results of this comparison will suggest whether a structural change in the health care delivery system of the U.S., to one similar to the health care service of Great Britain, may provide better health care to all Americans. If it is found that there is less variance in health status as a function of SES in a country with a NHS than in a country without a NHS, then support for the institution of a national health service may be warranted. If this is not found, or other variables are found to play a more significant role, then new knowledge critical to health planning on a national level may be suggested.

Chapter 2 surveys the literature on health status and socioeconomic status in the U.S. It begins with a discussion of the SES-health status relationship in the U.S and suggested explanations for this relationship, focusing on the two major explanations: unhealthy lifestyle behaviors and inadequate medical services. Following this discussion is a description of the professional fee-for-service health care system of the U.S. The review of the literature continues with a description of the National Health Service of Great Britain and a discussion of the SES-health status relationship within that country. Reasons for the failure of an NHS to develop in the U.S. are explored.

Chapter 3 presents a macro theoretical framework, focusing on the relationship between elements of the social structure and patterns of behavior. This theoretical framework uses a conflict approach to offer an explanation for the persistent association between SES and health status. This chapter concludes with the development of a hypothesis regarding the SES-health status relationships between the two countries.

The hypothesis developed in Chapter 3 is tested using the methodology presented in Chapter 4. This chapter begins with a discussion of the comparative method used in this study. The next section contains a description of the two data sets used, the Health and Lifestyle Survey 1984-1985 for Great Britain, and the U.S. Health Interview Survey, 1985. Variables of interest to this study are then described. Analytical models used to test the hypotheses are presented. Multiple regression analysis is used to determine the SES-health status relationship within each country, and the model which best describes these relationships is compared across countries.

Chapter 5 presents the findings of the correlates of levels of health status with SES and other predictor variables including age, level of education, and level of participation in health promotion behaviors. The analysis will include a discussion of within country relationships, and a comparison of these relationships to determine differences and similarities between the U.S. and Great Britain.

Chapter 6 presents the implications of the study. Focus is on how the findings relate back and add to previous research. The utility of the conceptual framework presented in the study is evaluated, and directions for future research are suggested.

CHAPTER 2
A REVIEW OF THE LITERATURE

Health Status and Social Class

One of the most consistent findings in epidemiological research has been the positive relationship between health status and social class, or the inverse relationship between various indicators of health status (e.g., morbidity levels) and social class. Regardless of the measure employed, whether it be income, education, or occupation, Americans of lower socioeconomic status, at all ages, have been found to have higher mortality, morbidity, and disability rates than do those in the middle and upper classes (Navarro, 1990). In addition, health problems of the poor are typically more serious, complex, and difficult to treat (Dutton, 1986).

In the U.S. the inverse relationship between SES and mortality rates has been studied in various communities, rural and urban, with all reporting similar patterns (Williams, 1990). While there has been an overall decline in mortality rates in this century, the difference in mortality rates between classes has not been eliminated. The gap remains substantial and appears to have stabilized during the last 40 years (Syme and Berkman, 1990) for almost all causes of death (Antonovsky, 1967; Dutton, 1986;

Freund and McGuire, 1991; Kitagowa and Hauser, 1973; McLeod and Kessler, 1990).

This phenomenon is not peculiar to the U.S. A number of studies of diverse populations have found that there are widespread and persistent social class differences in health and disease in many societies. Marmot et al. (1987), in a comparative study of social class and mortality in different societies, found that mortality varies by class in Great Britain (England and Wales), the U.S., Denmark, Norway, Finland, France, New Zealand, and Japan. In a comparative study of the U.S., Great Britain, and France, Behm and Vallin (1982) found no change since World War II in the higher rates of mortality among the lower classes.

In the U.S., class differentials in mortality rates have been especially pronounced in heart disease (Freund and McGuire, 1991). The researchers found that the heart disease mortality rates for the lower-middle class were nearly twice the rates for the upper-middle and upper classes, and the rates for the working class were over four times the rates for the upper-middle and upper classes. Analysis of the mortality rate for heart disease by occupation in 1986 revealed that people with lower income and belonging to the working class were more likely to die of heart disease than were people with higher income and belonging to the upper class (Kapantais and Powell-Griner, 1989). The mortality rate for those in the lowest occupational class (laborers, operators, and fabricators) was 86 per 100,000 population, while those in the highest class (managers and professional) had a mortality rate of 37 per 100,000 (Statistical Abstract of the U.S. 1988, 1988). Data from the 1986 National Mortality Followback Survey show that most of those who died of cerebrovascular disease and all other causes had family incomes of less than $25,000 in 1985, and the largest proportion of those who died had worked in the main occupational groups of the working class (Powell-Griner, 1990).

Additionally, strong gradient increases from the higher to lower classes have been found for infectious and parasitic diseases; cancers of the lung, stomach, bladder, and esophagus; respiratory diseases including tuberculosis; and diseases of the genito-urinary system. The class gradients have been moderately strong for hypertensive diseases, stroke, and diseases of the circulatory system; digestive disorders; endocrine disease, and metabolic diseases (Susser et al., 1985). In a study of variations in asthma deaths, Carr et al. (1992) found household income to be a significant predictor of both asthma deaths and hospitalization rates. Segal and Kotler (1991) conducted a longitudinal study of mortality rates of residents in sheltered care settings in California and found the residents almost three times more likely than the general population to die from heart disease, cerebrovascular disease, and all other natural causes with the exception of malignant neoplasms. The researchers concluded that the resident's high mortality rates were likely due to their low income status. Similarly, Port et al. (1990) found that residing in lower income areas had a strong negative effect on survival of chronic-dialysis patients.

The infant mortality rate of a nation is regarded as the most sensitive indicator of the health status of a population because it has long been seen as an indicator of the economic development and social equality of a country (Pampel and Pillai, 1986). It is also less contaminated by sundry environmental and behavioral factors influencing the health of adults. In the U.S., rates of infant mortality have declined steadily over the last several decades. The infant mortality rate in the U.S. in 1981 was 12 (per 1,000 live births); in 1985 it was 10.6; and in 1990 the infant mortality rate was 9.1 (Chapman, 1992). Lower income groups, however, have long been, and continue to be, characterized by infant mortality rates that are substantially above those in higher income areas (Stockwell et al., 1988; Wilkinson, 1986). This has been particularly evident in several urban areas since 1984, where the infant mortality rates have increased (Stockwell et al., 1987; Waitzkin, 1989). Based on information provided by the National Center for Health Statistics, in 1989 the infant mortality rate for the U.S. was 9.8. However, some infant mortality rates in selected metropolitan areas ranged from 16.2 in Dallas, TX, to 31.1 in Fort Worth, TX (Madigan, 1991).

A recent study published by the San Antonio, TX, Metropolitan Health District exemplifies the problem of high infant mortality rates found in American cities. This study compared the infant mortality rates for various income groups from 1980 to 1989 in San Antonio. For those who lived below the poverty level, the infant mortality rate in 1989 was 22, an increase of 11% from 1980. By comparison, for those who lived from 26% to 50% above the poverty level the rate was 6.7, a decrease of 56% (San Antonio Metropolitan Health District, 1989a).

Social class also correlates with maternal health. Marmot et al. (1987) found that women in the lower classes had higher rates of maternal mortality (death from pregnancy or birth related problems); the maternal mortality rate (per 100,000 per year) was 79 for the highest class and 144 for the lowest class. In a comprehensive study of inequalities in pregnancy outcomes, Rutter and Quine (1990) found social class differences in stillbirth, perinatal (stillbirths and deaths at 0-6 days), neonatal (0-27 days), and postneonatal (1-11 months) mortality rates. In 1986, the stillbirth rate for members of the highest social class was 3.7, compared to 6.6 for members of the lowest class; the perinatal mortality rate for members of the highest social class was 7.2, compared to 11.4 for members of the lowest class; the neonatal rate was 4.1 for the highest class compared to 6.0 for the lowest class; and the postneonatal rate for the highest class was 2.7, compared to 5.2 for the lowest class.

The birth weight of a child is also an important health indicator because it is considered one of the best predictors of a child's future well-being (Partnership for Hope, 1990). Low-birth weight (defined as weight at birth less than 5.5 pounds, expressed per 100 live births) has been shown to be strongly linked to the infant mortality rate, serious childhood illness, and lifelong handicaps (US HHS, 1990). The U.S. Office of Technical Assessment has estimated that the yearly health costs resulting from low-birth weight can range from $14,040 to $30,525 per child nationwide (Population Reference Bureau, 1990). The previously mentioned study published by the San Antonio, TX, Metropolitan Health District compared the rate of low birth-weight babies born in the city between 1980 and 1989 and found a pattern similar to that of infant mortality rates. In 1988, the national incidence of infants born with low-birth weights was 6.9 (Children's Defense Fund, 1991). For those persons living below the poverty level in San Antonio, the low birth-weight rate in 1989 was 11.4, an increase of 30% over 1980; for those living at 26% to 50% above the poverty level, the rate was 7.2, a decrease of 17% (San Antonio Metropolitan Health District, 1989b).

The literature has shown that there are clear social class differentials in mortality. These differences in mortality, however, are preceded by inequalities in morbidity. In 1986, those making $10,000 or less per year reported 4.6 times more morbidity than did those making over $35,000 per year ("Health, United States 1987," 1988). A similar pattern is observed when occupation is used rather than income. Between 1983 and 1985, blue-collar workers reported a morbidity rate (9.5%) that was 2.9 times higher than that of professionals (3.2%) ("Health Characteristics by Occupation and Industry: U.S., 1983-1985," 1989).

Higher rates of morbidity among those in the lower classes have been observed for a vast array of conditions. Gradients have been stable and consistent over time for rates of chronic illness (Haan and Kaplan, 1986; Jaco, 1958; Susser et al., 1985), and especially for coronary heart disease. Many studies have shown that social class is inversely associated with heart disease morbidity and mortality in most industrialized countries (Freund and McGuire, 1991). In a survey conducted in 1987, subjects in the lowest social classes reported 50% higher rates of angina than did subjects in the highest classes (Smith, 1990). The same study also found higher blood pressure rates in members of the lowest classes. Marmot et al. (1987) found similar patterned class differences related to rates of heart disease and diseases of the respiratory system. In a study of Canadian males, Hay (1988) found that the number of reported health problems increased significantly as family income decreased. Satariano (1986) conducted a study among depressed residents of Alameda County, CA, and concluded that health status (measured by number of chronic conditions) was more strongly associated with income than with race. He also found that for all age groups, health status was significantly lower for the more severely financially depressed (income below $6500) than for the less severely financially depressed (income above $6500). Poor children have been found to be particularly affected by high rates of morbidity. Egbuono and Starfield (1982) found that poor children were more likely to become ill, to suffer adverse consequences from illness, to have chronic conditions, to be in poor or fair health, and to die, than children in higher classes. In a study of the relationship between children's health and single motherhood, Angel and Worobey (1988) found a consistent association between low income and reports of children's poor health. They concluded that a significant amount of the "less than optimal" reported health was associated with economic strain.

Rates of reported disability in the lower classes have been higher than in the upper classes (Lerner, 1975; Newacheck et al., 1980; Smith, 1990). In the U.S. in 1988, the average number of disability days per person for persons with an income below $10,000 was 26.6, and for persons with an income greater than $35,000, was 9.7 (Statistical Abstracts of the U.S. 1991, 1991). Arthritis, the leading cause of disability after heart disease, has been found to be twice as common in the poor as in the non-poor (Dutton, 1986). As a consequence of these higher rates, members of the lower classes have also been shown to have both a higher number of restricted activity days per year, and restricted activity days which extend for a greater period of time (Lerner, 1975; Marmot et al., 1987). Hay (1988) found that number of disability days increased significantly as family income decreased for Canadian males. In a study of children and disability, Egbuono and Starfield (1982) found that poor children had twice as many bed-disability days, and four times as many hospital days compared to children in the middle class.

Other studies confirm this strong connection between income and limitation of mobility or activity. In 1983, of those earning $10,000 or less per year, 23% reported activity limitation due to chronic conditions. For those earning $35,000 or more per year, 9.4% reported activity limitation due to chronic conditions. Five years later, in 1988, the percentage of those earning $10,000 per year or less who reported activity limitation increased to 23.2% (+.2%), while of those who earned $35,000 per year, the percent decreased to 8.1% (-1.3%) ("Health, United States

1989," 1990). According to the report published by the National Center for Health Statistics, Health of Black and White Americans, 1985-1987 (1990), for the years 1985-1987, of those earning less than $20,000 per year, 21.4% of whites and 18.3% of blacks reported activity limitation due to chronic conditions. Of those earning $20,000 or more per year, 9.7% of whites and 7.3% of blacks reported limitation of activity. Maddox and Clark (1992) conducted a 10-year longitudinal study on functional impairment in later life (58 to 63 years), and found that, for all educational levels, the poor had higher levels of functional impairment over the decade. In this study, both initial and subsequent levels were higher for the poor.

In general, life expectancy is shorter for persons in lower social classes than among persons in higher social classes. These social class differentials in life expectancy are greater for acute communicable diseases such as infective, respiratory, and digestive diseases rather than for major chronic diseases such as stroke, cancer, or heart disease (House, 1981a; Statistical Abstracts of the U.S. 1991, 1991; Susser et al., 1985). Since the differentials in life expectancy are greater for acute communicable diseases, it has been suggested that these differentials probably stem more from inadequate medical care and poor living conditions of the lower status group than from other causes (House, 1981a).

Some studies have investigated people's perceptions of their health, or self-assessment of health, as it relates to social class. For those persons earning less than \$20,000 per year, 16.6% of whites and 19% of blacks self-assess their health status as fair or poor compared to those who earn \$20,000 or more per year, where 5.1% of whites and 7.6% of blacks rate their health as fair or poor ("Health of Black and White Americans, 1985-1987," 1990). Cockerham et al. (1988) found that the more affluent persons in the U.S. have rated their health more positively, and concluded that higher income promotes higher self-assessments of health. Similarly, Harris and Guten (1979) found that persons who rated their health as poor were more likely to be poor. In these studies, self-reported perceptions were almost identical to objective health status as reported by physicians.

A sustained inverse relationship between social class and health status has been found to exist for rates of morbidity and mortality, both general and disease-specific, for disability rates, and for perceptions of health, while a positive relationship exists for social class and life expectancy. Why these relationships exist will be the next topic of discussion.

Causes of Poor Health Status

There have been several explanations proposed as to why people in lower socioeconomic classes have higher rates of morbidity and mortality than those in higher classes. Four major contributing factors have been postulated: (a) environmental factors/living conditions, (b) genetic or biological factors, (c) unhealthy lifestyles and, (d) inadequate access to health care services (U.S. Department of Health, Education, & Welfare, 1979). Other explanations have focused on the widespread belief among members of the lower classes in a lack of personal control over one's life (Kohn, 1972), and the notion of a need hierarchy (McKinlay, 1990). The two perspectives which have received the most attention and are considered to be most valid are the two which focus on unhealthy lifestyle behaviors and inadequate health services as the primary cause of poor health status among members of the lower classes. Poor people get sicker than the wealthy, and sick poor people have more limited access to health care services than do equally sick wealthy people.

Environmental Factors/Living Conditions

Early explanations of the link between SES and health focused on the living conditions of the poor. Overcrowding, substandard housing, and malnutrition were some of the factors identified as responsible for high rates of morbidity and mortality among this group. People in the lower SES group lived in a more toxic, hazardous, and non-hygienic environment which resulted in more disease outcomes (Syme and Berkman, 1990; Williams, 1990). Enormous improvements have been made in environmental quality, and the impact of infectious diseases on health status has declined. Environmental advances have included rising standards of living, improved living conditions (such as housing, advances in nutrition, clean air and water, and sewage control) and improved food handling (McKeown and Brown, 1955; Dubos, 1959; McKeown and Record, 1962; McKeown et al., 1975). As public health measures such as improved sanitation and mass immunizations became more widespread, it was predicted that SES differentials in health status would disappear. As the expected prediction was not fully realized, other explanations gained more attention and credibility (Williams, 1990).

Genetic or Biological Factors

The genetic or biological explanation posits that a person has a predisposition or increased risk of incurring a disease based on one's genetic composition (Stone, 1989). The logic is that if a disease appeared in a person who was a member of the lower class, and it was left untreated, that disease would reappear in future generations. It was theorized that because people in the lower classes continued to have poorer health than those in upper classes, despite the aforementioned improvements in quality of life, their poorer health could have been the result of inherited susceptibility. Some disease entities for which this has been suggested are coronary-artery disease, diabetes, and hypertension, all of which appear with greater frequency in the lower classes (Stone, 1989). This hypothesis, however, is highly controversial, and today appears to lack significant support. It is believed that it is a combination of complex factors which determines whether a gene will find expression as a disease, and not merely a result of being a part of one's genetic makeup (Lappé, 1987).

Personal Control

Melvin Kohn (1972) believes that members of the lower classes are vulnerable to forces that they cannot control, and often are unable to take advantage of options that might otherwise be available to them. His research has shown that the lower one's social class position, the more likely an individual is to value conformity to external authority, and to develop a fatalistic belief that one is at the mercy of forces and people beyond one's control. Kohn (1972) has hypothesized that this conception of social reality is fostered by the type of work in which people in the lower class engage. This work is characterized as having little substantive complexity, being under conditions of close supervision, and affording little flexibility in routine.

Kohn has found these conditions to be those which reduce one's sense of personal control.

Black (1980) found that lack of personal control was an important factor linking low social status with poor health, and Syme and Berkman (1976) argued that it has contributed to a generalized susceptibility to disease among the lower classes. Lack of personal control affects how people respond to life changes, life stress, and the ability to cope with stress, all of which affect personal health. For example, it has been shown that stress, by lowering immunity, can aggravate one's vulnerability to infectious microorganisms (Freund and McGuire, 1991). House (1981b) found that social stress increased the effect of physical stressors on the body. Workers who were exposed to chemicals known to cause respiratory problems suffered even higher levels of the disorders if they were simultaneously exposed to intense supervisory pressures. Given that members of the lower classes frequently work under conditions of close supervision, as described by Kohn's theory of social reality, one may conclude that they may indeed be particularly susceptible to this effect.

A belief that one has little control over one's life may produce a fatalistic orientation toward one's health, leading to a situation where treatment is not sought until the late stages of an illness. This belief can be disadvantageous for those who engage in such thinking because early detection is an important variable in the cure of illness, and in prevention of escalation in severity.

While it may be true that lower class membership may foster one's sense of lack of individual control, the real problem is explaining why this belief occurs. In regard to health care, people in the lower classes are those who have restricted access to a system which could help them. Due to financial constraints, they often have little control over the decision to enter, and seek care, treatment, and cure. It may be that because they cannot enter the system, they feel a lack of control over their health.

Need Hierarchy

McKinlay's (1990) notion of a need hierarchy refers to the belief that for members of the lower classes, primary needs such as food, clothing, and shelter are perceived as related to survival and take precedence over secondary needs such as medical and dental care. For members of the affluent classes, resources are available that allow secondary needs to be recognized as important, a priority position to be assigned, and attention to be directed toward them. For the poor, secondary needs (such as medical care) assume a position of low importance, and are eclipsed by the more pressing primary needs. Rather than giving priority to a potential danger, such as illness, they are more concerned with immediate dangers, such as hunger and inadequate shelter.

The idea of a need hierarchy explains why some members of the lower classes do not seek medical care. Again, however, the problem may be one of access. Members of the lower classes, due to financial constraints, are forced to rate medical care as a secondary priority. It receives a lower priority on the need hierarchy than do those concerns defined as primary survival needs.

Lifestyle Behaviors

A position which has received and maintained considerable support in the past three decades as an explanation of poor health has been one that promotes individual responsibility for health through living a healthy lifestyle. The "lifestyle-factor" theory states that much disease and disability is caused by behavioral factors that are within the individual's control, such as diet, exercise, smoking, alcohol use and other forms of risk-taking behaviors. It is believed that these risk factors are additive: The more of them one has, the greater the increased likelihood or total risk of disease. Healthy lifestyles increase the ability of each American to avoid disease and disability. If all Americans were to engage in a healthy lifestyle, which involves engaging in health promotion behaviors, the health status of the country would increase accordingly (Knowles, 1990; Sullivan, 1990b). Health promotion, or healthy behaviors, are defined by Harris and Guten (1979) as any behavior which is performed by a person, regardless of his or her perceived health status, in order to protect, promote, or maintain his or her health, whether or not such behavior is purposely directed toward that end. Some researchers (McKeown, 1979; Susser, Hopper and Richman, 1983) believe that lifestyle and social factors determine a person's state of health more than does medical treatment.

It has been suggested that each of the top ten causes of premature death in the U.S. are significantly influenced by personal behavior and lifestyle choices (Sullivan, 1990b), and that control of the present major health problems in the U.S. today (heart disease, cancer, and stroke) depends directly on modifications in the behaviors and living habits of individuals. Heart disease and stroke have been shown to be related to dietary factors, smoking, and lack of exercise. Smoking and diet are also related to the incidence of cancer (Berkman and Breslow, 1983; Knowles, 1990).

Advocates of the lifestyle choice theory argue that people need to stop or reduce the frequency of behaviors that endanger their health (smoking, drinking, poor dietary habits), and/or adopt new patterns of behavior which enhance their health (proper diet, sleep, exercise, weight control).

Smoking alone is cited as the most preventable cause of death in the U.S., and has killed millions of Americans (Sullivan, 1991). It is estimated that better control of health risk factors, along with prenatal care and use of seat belts, could prevent between 40% to 70% of all premature deaths, a third of all cases of active disability, and two-thirds of all cases of chronic disability (Sullivan, 1990b). Over a decade ago, _Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention_ (U.S. Department of Health, Education, and Welfare, 1979), concluded that seven of the ten leading causes of death could be reduced if citizens did five things--used antihypertensive drugs, improved their diets, exercised more, and ended smoking and alcohol abuse. Former Secretary of Health and Human Services Louis Sullivan has advocated the creation of a "culture of character" in the U.S., the fostering of a climate of individual responsibility in which people would be encouraged to engage in healthy behaviors. With all Americans practicing health promotion behaviors, they would be assisting in the prevention of disease, and the preservation of a healthy society. Prevention of disease has been indicated to be the single most important factor in maintaining good health (Sullivan 1990b).

It has been suggested that the health behaviors approach grew from the considerable disillusionment with medicine that was expressed during the 1960's and 1970's

(Glassner, 1989). Gillick (1984) has proposed that the jogging craze of the 1960's was a result of the recognition by a large part of the American population that medicine alone could not be relied upon to prevent death. Thomas McKeown (1979) wrote that it was an individual's lifestyle, together with social and environmental factors, that determined a person's state of health more so than medical treatment. This belief was perhaps best exemplified by Ivan Illich in his book, Medical Nemisis: The Exporpriation of Health (1975), by Thomas Szasz in The Myth of Mental Illness; Foundations of a Theory of Personal Conduct (1961), and Rene Dubos, in Mirage of Health, (1959). Each of these books suggested that one's best hope for medical and physical health was to be found outside modern medicine.

In the early 1960's Belloc and Breslow (1972) conducted a preliminary study which analyzed the relationship between health status and health practices. The study was undertaken in order to determine which health habits most significantly affected life expectancy and health. They concluded that there were seven health habits which did significantly affect life expectancy and health: (1) eating three meals a day at regular times with no snacking, (2) eating breakfast every day, (3) getting moderate exercise two to three times a week, (4) getting seven to eight hours sleep each night, (5) abstaining from smoking, (6) maintaining moderate weight, and (7) either abstaining from alcohol or drinking only in moderation (Belloc and Breslow, 1972).

The first and largest American study of health practices, which became known as the Alameda County Study, began at the Human Population Laboratory (HPL) in the University of California at Berkeley. In 1959, a planning grant from the National Institutes of Health established the HPL with three objectives: (1) to assess the health (physical, mental, and social dimensions) of persons living in Alameda County, California, (2) to ascertain whether particular levels in one dimension of health tend to be associated with comparable levels in other dimensions, and, (3) to determine relationships of various ways of living and selected demographic characteristics to levels of health (Berkman and Breslow, 1983). As the study progressed, the third objective became more prominent than the first two and attracted major attention. Prior to this study, there was little evidence to support the idea that the health behaviors identified by Belloc and Breslow could affect personal health.

In the Alameda County Study, data were collected from survey participants in 1965, and nine years later in 1974. The conclusion of the longitudinal study was that five of the seven health practices identified by Belloc and Breslow were significantly associated with mortality, each leading to greater health and longevity. Each of the five was associated independently of the other health practices. Those who engaged in the high-risk health practices had life expectancies significantly shorter than others of the same age who did not. The high-risk behaviors identified were: (1) smoking cigarettes, (2) consuming excessive quantities of alcohol, (3) being physically inactive, (4) being obese or overweight, and (5) sleeping fewer than seven or more than eight hours per night (Berkman and Breslow, 1983).

Since the landmark Alameda Study was conducted, subsequent research has continued to support these findings (Haan et al., 1987; Morris, 1990; Ott, 1990; West, 1988). In regard to smoking behavior, the Alameda Study found a clear gradient among both men and women. Present and past smokers experienced higher rates of mortality than those who had never smoked. Smokers had worse health status scores at follow-up than did those who were smoking during the first wave of data collection, and reported more symptoms of chronic health conditions (Berkman and Breslow, 1983). In a 10-year longitudinal study of mortality, Hirdes and Forbes (1989) found that smoking was the strongest predictor of mortality in their sample. Numerous national surveys (U.S. Department of Health, Education, and Welfare, 1979; U.S. Department of Health and Human Services, 1980a; U.S. Department of Health and Human Services, 1990) have found cigarette smoking to be strongly associated with increased mortality rates; smoking during pregnancy to be associated with miscarriages, fetal and neonatal mortality, low birth weight, and developmental retardation; and the link between smoking and morbidity (especially heart disease, cancer, and emphysema) to be undeniable. Further, smokers themselves recognize these links. A recent study by Thorlindsson et al. (1991) found a significant inverse association between smoking and perceived health status. Recently, an increasingly strong body of evidence purports to link second hand smoking with mortality (Janerich et al., 1990; Raeburn, 1991).

The Alameda Study also looked at frequency and amount of alcohol consumption. The highest mortality rates occurred among respondents who had a high drinking index (more than 45 drinks per month). Moderate drinkers, those who had 17 to 45 drinks per month, had the lowest mortality rates, and their rates were lower than abstainers, light drinkers, and heavy drinkers. Those who did not drink at all had even more negative health status scores than heavy drinkers (Berkman and Breslow, 1983). However, other studies have shown that moderate to heavy alcohol consumption has been linked to greater risk of stroke in men (Gill, 1990), and higher death rates from cirrhosis of the liver and malignant neoplasms for both sexes (Fuchs, 1990). Knowles (1990) reported excessive use of alcohol to be related to vitamin deficiencies; inflammation of the pancreas, esophagus, and stomach; muscular and neurologic diseases; cancer of the mouth, pharynx, larynx, and esophagus; and 50% to 75% of all deaths and injuries due to automobile accidents. Thorlindsson et al. (1991) found a significant negative association with perceived health status and drinking.

Health scores for participants in physical activities were higher for every age and sex group considered in the Alameda Study. Those who reported the least activity also had a higher risk of mortality. Of special note was the marked difference between participants who reported no activity and those who reported even a little activity (Berkman and Breslow, 1983). Other researchers have also identified significant relationships between physical activity and health status. A study conducted by Lamb and Roberts (1990) showed that sports participants rated their health significantly better than non-participants, and these beneficial consequences of perceived health were reflected in reduced risks of mortality, higher morale, a tendency to abandon the sick role sooner, and a faster return to employment following heart surgery. In another study, Roberts et al. (1989) found that participation in indoor sports was positively related to health status for all age and sex groups studied. Physical exercise and sports participation have been found to positively affect perceived health directly (Mechanic and Hansell, 1987; Thorlindsson et al., 1991), and also indirectly because sports participants were found to smoke and drink less (Thorlindsson et al., 1991).

Berkman and Breslow (1983) reported that individuals who were within 10% of their optimal weight had the best health scores on the follow-up study. People who were extremely underweight (30% or more under their desirable weight) had the poorest health scores. However, obese participants (30% or more over their desirable weight) were at greater risk of dying than any group, although the extremely underweight also displayed a high risk. Excessive weight is a serious health problem as it has been associated with high rates of coronary heart and other circulatory diseases, hypertension, diabetes, gall bladder disease, degenerative joint disease, some types of cancer, respiratory disease, arthritis, and liver and biliary tract disorders, and high mortality rates from these diseases. The reduction to, or maintenance of weight at normal levels has been found to reduce the risk and severity of several of these chronic conditions (Dwyer et al., 1970; Ross and Mirowsky, 1983; Stuart and Jacobson, 1979; U.S. Department of Health and Human Services, 1980b). Pre-term babies of obese mothers have been found to have an increased likelihood of low birth weight or to die in infancy (Lucas, 1988).

Seven to eight hours of sleep per night was found to be the optimal amount for good health status. Participants who had less than seven hours had the least favorable health scores at follow-up, while those with more than eight hours also had low scores. As for mortality rates, both men and women who reported that they slept seven to eight hours each night had significantly lower mortality rates than those who had less than six or more than nine hours of sleep. Persons who reported six or fewer hours of sleep had the highest mortality rates, and this was most pronounced in the 30 to 49 year-old age group (Berkman and Breslow, 1983). Sleep generally has received little attention as a factor in health and mortality, but a study by Kripke et al. (1979) did find that extremely long (10 hours or more) or short (less than four hours) of nightly sleep was associated with mortality from heart disease, stroke, cancer, and suicide. And, since sleep deprivation will ultimately lead to death, it is clearly necessary for survival (Kleitman, 1963).

Socioeconomic Status and Health Behaviors

In addition to looking at the relationship between health behaviors and health status, the Alameda County Study also looked at the relationship between engagement in health behaviors and socioeconomic status. Considerable similarity has been found to exist within each social class in lifestyle behaviors, especially as it pertains to appearance, food, exercise, smoking, and drinking alcohol (Cockerham et al., 1986). Berkman and Breslow (1983) reported that members of the low-income group were three to four times more likely to engage in the high risk health practices than members of the highest group. The poor were more likely to be heavy drinkers and smokers, to be overweight, and to eat a diet high in fat. Quine (1990) found that in Great Britain members of the lower classes engage in more adverse health behaviors than members of the higher classes. Preventive health care behaviors have been found to be affected by SES, and those in the middle and upper SES participate in more preventive behaviors, and visit physicians more frequently for preventive care (Cockerham et al., 1986; Harris and Guten, 1979). Rosenblatt and Suchman (1964) have suggested that members of the higher classes apply themselves more fully to preventive activity because they focus more on maintaining their health for the future, while poorer people tend to be more present-oriented and deal with symptoms as they may arise.

Each health behavior that Berkman and Breslow (1983) found to be associated with health status is also related to SES. Smoking is far more common in the lower classes than in the higher classes, and longitudinal studies which have shown a reduction in smoking behavior show the least reduction in the lower classes (Khosla and Lowe, 1972; Marmot et al., 1984; Morris, 1990; Ott, 1990; West, 1988). The case of smoking is an effective one to demonstrate the relationship among SES, health behaviors and health status.

Smoking is more common in classes of lower SES, and, as previously cited, is also strongly associated with specific causes of death such as lung cancer and respiratory diseases. It is not surprising, therefore, that these specific causes of death also have higher frequencies in the lower classes. There is a particularly high mortality for lower class men from lung cancer and other respiratory diseases; they are almost three times as likely to smoke than men in higher classes (Marmot et al., 1987). The relationship between social class and mortality, may, to some extent, be affected by health behaviors.

The same chain of causation can be seen in alcohol use. Alcohol consumption is highest among the lower classes (Dutton, 1986; Ott, 1990; West, 1988). As mentioned, alcohol is related to high mortality rates for stomach disorders, muscular disorders, strokes, and cirrhosis. These are the same diseases for which the poor have higher mortality rates than the more affluent ("Health United States 1988," 1989).

Exercise habits differ between classes in much the same way as those for smoking and drinking. Members of the lower classes exercise less frequently than those of the higher classes (Lamb et al., 1988; Ott, 1990). In a longitudinal study conducted between 1980 and 1990, Morris (1990) found that there was no narrowing of the exercise gap over the decade, with those in the higher classes continuing to exercise more frequently than those in the lower classes. Over the past two decades, a widespread and growing interest among the middle and upper classes in the pursuit of fitness has been documented by national surveys and the consumer marketplace. The members of these classes have been the purchasers of exercise equipment, diet foods, vitamin products, and health club memberships (Glassner, 1989).

Prior mention has been made of the positive association of physical activity with health status. A study conducted by Lamb et al. (1988) found that fewer low class males reported good or excellent health than their higher class counterparts. They also found that income differences in health status indicators were narrower among sports participants than among the general population. That is, members of the lower classes who do participate in physical exercise have health statuses more equal to members of the higher classes than what is seen in the general population. The researchers concluded that if low-income persons were to exercise, the gap in health status between the rich and poor would narrow.

A strong inverse relationship between SES and obesity has consistently been recorded in the literature, a relationship which is especially strong among women (Dutton, 1986; Dwyer et al., 1970; Freedman, 1990a; Morris, 1990; Ross and Mirowsky, 1983; Stunkard, 1975). While this relationship has long prevailed for adults, obesity has only recently become an increasing problem among low-income youth (Freedman, 1990a). As it relates to patterns of morbidity, members of the lower classes suffer from higher rates of diseases associated with obesity than do those in the higher classes. These include heart disease and other circulatory system disorders, hypertension, diabetes, arthritis, and respiratory disorders, (U.S. Department of Health and Human Services, 1990).

Researchers have consistently reported that people in the lower classes engage in more health risk behaviors and fewer health promotion behaviors (Berkman and Breslow, 1983; Cockerham et al., 1986; Cockerham et al., 1988; Dutton, 1986; Harris and Guten, 1979, Khosla and Lowe, 1972; Morris, 1990; Quine, 1990). Thus, as a cause of poor health, people in the lower classes appear to be more at risk due to their individual lifestyle behaviors.

We have seen that there is an inverse relationship between various indicators of health status and SES, that practicing healthy lifestyle behaviors is associated with positive health status, and that members of the lower SES groups tend not to engage in healthy behaviors. A question to be addressed is why this group with the poorest health status in the U.S. does not engage in healthy lifestyle behaviors to improve their health. Many researchers have addressed this issue and several explanations have been suggested.

The first explanation, which has been discussed, is Kohn's (1972) theory of control. Previously it was presented as a direct effect, that is, that a belief in a lack of control over external conditions by members of the lower classes could account for their poor health status. In this explanation, it has an indirect effect through health behaviors. This explanation suggests that it is a feeling of a lack of control over external forces that constrains low SES persons from engaging in healthy behaviors, thus negatively affecting their health status. This explanation looks on the acquisition of healthy behaviors and a healthy lifestyle as behaviors learned through family socialization. Lau (1982), and Lau et al. (1990) have found that parents are much more important as sources of influence over health behavior and practices than any other source. Thus, good health habits learned as a child could affect later beliefs regarding the control of health.

Persons with a feeling of a sense of control over their lives, or an internal locus of control, believe that their actions and decisions help shape the outcome of their lives. These people believe that they are responsible for their own health, and that illness can result in part from not engaging in healthy lifestyle behaviors. Several studies have reported that an internal locus of control is significantly associated with a positive and active role in health related behaviors, and as a result, these people enjoy better health (Hayes and Ross, 1987; Seeman and Seeman, 1983). People with an external locus of control believe that others and external forces shape their destiny. They believe that there is nothing they can do to prevent illness, that good health is the result of luck or chance, and therefore do little to actively protect it. Many researchers (e.g., Cockerham et al., 1986; Harris and Guten, 1986; Hayes and Ross, 1987; Seeman and Seeman, 1983) report that people of lower SES display this sense of lack of control regarding health care and have found it to be significantly associated with: (1) less self-initiated preventive care, (2) less optimism concerning the efficacy of early treatment, (3) poor self-rated health, (4) more illness episodes, bed confinement, and dependency on physician intervention and, (4) frequent mention of health care system use as a health promoting behavior.

McKinlay's (1990) notion of a need hierarchy is another perspective which has been used to explain why the poor do not engage in healthy lifestyle behaviors. The need hierarchy is seen as exerting an indirect effect on health status, mediated through health behaviors. From this perspective, the poor concentrate more on their daily struggle to survive, and to meet their basic needs of food, clothing, and shelter than on the more distant concerns of health. This can be well demonstrated using the example of weight control. We have seen that low SES members tend to be more obese than their middle and upper class counterparts. Freedman (1990a), in writing about inner city poor, has found that the hazards that may result from a poor diet and obesity pale when placed next to problems like crime and crack use. An inner-city resident interviewed by Freedman stated, "I should be concerned about my health but the way I figure I might as well live high on the hog while I can" (1990a: 1A). Another aspect of the need to survive is demonstrated in an interview with the owner of a McDonald's franchise in Harlem. He compared the food served in the McDonald's franchises in different parts of New York City and said that salads are bought downtown, but up here... "It's eat to survive...people are trying to get the biggest sandwich" (Freedman, 1990b, p. 6A). In many instances, poor people do not eat healthy foods simply because they cannot afford to buy foods such as fresh meats and produce (Freedman, 1990b).

A cultural explanation has also been proposed to explain why low SES people do not engage in healthy lifestyle behaviors, especially in regard to obesity. Proportionately more members of the lower classes, than of other classes may not regard obesity as culturally undesirable. Among these members of the lower classes, obesity is connected with the desirable traits of well-being and prosperity. For these same people, being thin is associated with the undesirable traits of hunger, being on welfare, having AIDS, and drug addiction (Dwyer et al., 1970; Freedman, 1990a).

Some researchers have blamed the health care and educational systems for the failure of low SES people to engage in healthy lifestyle behaviors. Cockerham et al. (1986) argue that the medical system is inept in explaining health and illness behavior to the poor, and discourages interaction by health care professionals with this group. Health care professionals also do not encourage or reinforce self-management of this group, believing that they are unable to understand and carry out such techniques. The poor suffer from systems which have not adequately taught them adequate health information, and as a consequence have a real lack of knowledge in assuming responsibility for their health (Feldman, 1968; Freedman, 1990a, 1990b; Knowles, 1981; Susser et al., 1985). Morris (1990) and Barber (1991) believe that health education needs to be intensified and health promotion campaigns focused on this at risk group.

The lifestyle-behaviors explanation for SES differentials in health status views individuals as producers of health rather than simply consumers of health care. It focuses on the individual as at least partly responsible for his or her own health status, thus also partly responsible for creating the problem of class discrepancies in health care in the U.S. Changes in individual behavior, the model proposes, will lead to changes in SES differentials in health care status.

An alternative theoretical orientation focuses on the social structure rather than on individual behaviors as a cause of poor health among members of low SES groups. This orientation focuses on structural barriers present within the society which prevent the poor from accessing the health care system.

Inadequate Health Care Services

Inadequate access to health care services for the poor is the second major explanation offered to account for SES differentials in health status. This approach suggests that the lower classes have poorer health because members of the lower classes have less access to the medical resources available in our present health care system. According to this view, there are several constraints which prevent access to the system. The first is economic. Members of the lower classes have fewer resources to purchase care in the system. The second constraint is political, and is found within the organization of health care services. Poor people are more likely to receive health care in public clinics, or out-patient and emergency rooms of hospitals, where care is often impersonal and dehumanized. In contrast, those in the middle and upper classes are more likely to receive their care in private offices and hospitals (Reissman, 1990). A third constraint, however, could be ideological or cultural, and would include all the lifestyle-behavioral, health-producing factors of the previous section.

Those unable to access the system are a diverse group. Approximately 33 million Americans, or 15% of the population, have no health insurance (US GOA, 1991), and hence make less use of health services (Riessman, 1990). Thirty-four percent of the nation's poor have no health insurance (US GAO, 1991). Included in this group are the self-employed, part-time workers, and seasonal workers, the unemployed, and full-time workers whose employers offer either unaffordable or no insurance. Two-thirds of the uninsured and uncovered are employees or dependents of employees (Bodenheimer, 1989; Harvey, 1990; Tupper, 1990). More than two-thirds of full-time union workers either cannot afford or are not offered health insurance (Sulvetta and Swartz, 1986). Fourteen percent of service workers in the U.S., and 10% of workers in the manufacturing industry have no health insurance (US GAO, 1990). In 1987, 35% of workers in the U.S. aged 19 to 64 years who were full-time/ full-year employees had no health insurance. Forty-two percent of the part-time/part-year workers had no health insurance, and 24% of the unemployed or those not in the work force had no health insurance (US GAO, 1990). Of working Americans, the working poor are those most likely not to have health insurance. In Michigan in 1987, 55% of workers earning $1,000 to $9,999 per year had no insurance, 33% of those earning $10,000 to $19,999, 7% of those earning $20,000 to 29,999, 3% of those earning $30,000 to 39,999, and 3% of those earning $40,000 and above had no health insurance (US GAO, 1990).

In addition to the presence or absence of health insurance, other economic factors which have been shown to greatly influence use of health care services include the cost of services, and family income (Riessman, 1990). The cost of health care has steadily increased as a percent of the gross national product (GNP) since 1929, when data were first collected, showing especially dramatic increases from 1980 to 1986. From 1970 to 1979 health care expenditures increased 1.2%, from 7.4% to 8.6% of the GNP. From 1979 to 1986, they increased 2.3%, from 8.6% to 10.9% of the GNP ("Health United States 1987," 1989). Expenditures for medical care are greater than for other consumer expenditures, and have been increasing at a more rapid rate. In 1987, the consumer price index (CPI) for medical care was 462.2, an increase of 6.6% from the previous year, 1986. In comparison, the CPI for food was 333.0, an increase of 4.2%; for housing, 371.0, an increase of 3%; for energy, 371.1, an increase of 0.4%; and for personal care 299.6, an increase of 3.7% ("Health United States 1987," 1989). The CPI, a composite index relating to prices of specific consumer goods and services, is used as a primary measure of inflation. It is based on the average prices of some 400 different items purchased by consumers (Strauss, 1988).

In 1966, the Medicaid program was instituted in the U.S. to help provide medical care to the poor. A federally and state-funded indigent-care insurance program, over the years it has diminished in size and declined in capacity to provide medical services to the poor. In 1976, 65% of the poor were covered by Medicaid, in 1984 the number had decreased to 46% (Waitzkin, 1989). As previously stated, poor children are especially vulnerable to inadequate medical services. By 1990, Medicaid covered fewer than 60% of children who lived below the poverty line (Harvey, 1990). During the 1980's there were increases in deductibles, and federal and state funding of the program was greatly reduced. In addition to Medicaid cutbacks, all public-sector health programs which had been targeted to help the poor suffered similar fates. Block grants for maternal and child health, migrant health services, community health centers, birth control services, health planning services, the National Health Service Corps, and the Indian Health Service all experienced significant reductions in funding (Starr, 1982; Waitzkin, 1989).

Former Secretary of Health and Human Services Louis Sullivan has stated that prevention is the single most important factor in maintaining good health (Sullivan, 1990a). Prevention, however, includes more than just preventive behaviors. It also includes the willingness and opportunity to receive preventive medical care. Adequate prenatal care for pregnant women has been shown to play a large role in preventing infant mortality and other adverse pregnancy outcomes such as Down's syndrome, yet poor pregnant women are less likely to receive prenatal care than are pregnant women in other SES groups (Beeghley, 1983; Nersesain, 1988; Susser et al., 1985). Screening for the early detection of disease can reduce the risks from cancer of the neck, uterus, and breasts. A study conducted by Mamon et al. (1990) looked at factors related to receiving adequate screening for cervical cancer. They found that women who had low incomes and those without medical insurance were significantly less likely to receive adequate Pap testing. In a similar study, Ackerman et al. (1992) found that the percentage of women who had had a Pap smear within the previous year was positively associated with income. Early intervention and medical management of disease, especially chronic illness, can affect both survival rates and quality of life. The higher social classes have consistently been shown to benefit most from preventive techniques (Susser et al. 1985; Williams, 1990). Funding for immunization clinics has been drastically reduced in the 1980's. This has resulted in a decline in the proportion of poor children who are immunized, and a corresponding decrease in their health status (Bodenheimer, 1989).

Apart from the direct costs of medical care, several researchers (Beeghley, 1983; Dutton, 1986; Reissman, 1990; Roth, 1990; Williams, 1990) have suggested that there are additional indirect costs borne by the poor. They include the time expenditures necessary to obtain care, the fragmentation of the system, and the dehumanizing aspect of the system. For example, the employed poor generally do not have sick time built into their jobs. As a result, a visit to a health care provider during the work day means a reduction in that day's salary. Taking a day off for sickness results in the loss of an entire day's wages (Beeghley, 1983).

The time needed to access the system is another problem faced by lower class individuals. The geographical distribution of physicians finds most physicians located outside of poor neighborhoods. Corporate hospitals choose not to locate in impoverished areas (Starr, 1982). This means increased time for the poor to travel to medical facilities, often by public transportation (Reissman, 1990). When at the hospital or clinic for care, they are more likely to be kept waiting for care, and to be rushed through when they are attended to (Roth, 1990). They also might be treated with less consideration and respect than those who are not poor, and those labeled as "welfare cases" are often perceived as not deserving of the best care (Roth, 1990).

The fragmentation of the system also works against the poor seeking medical care, and affects the quality of care received. The poor are more likely to receive ambulatory care in clinics, in hospital emergency rooms, and outpatient departments (Reissman, 1990). The physical organization of the hospital emergency room and clinics can be confusing, thus discouraging entry into the system (Beeghley, 1983). Members of the middle and upper classes are more likely to receive their treatment in a doctor's office. The poor are more likely to see a different health care provider on each visit and to receive care from non board-certified physicians (Nersesian, 1988).

The dehumanizing atmosphere of the clinics and hospitals has been identified as a reason why poor people choose not to enter the system. As the health care providers in these institutions are generally busy, they have often been found to be impersonal and insulting to lower class persons. The poor are admonished for not having come sooner for care, and might be given unrealistic plans of care (Roth, 1990). Beeghley (1983) suggests that the health care system may ignore the needs of the poor, their financial constraints, and the stressful situations they encounter when they enter the health care system.

There is a vast social distance perceived by most physicians between themselves and lower class patients. Miller (1978) studied the patient-physician relationship and found that physicians are less interested in lower class patients, are inclined to pass them off to other practitioners, and accord them less personalized treatment. The more affluent members of the society are accorded preferential medical treatment because physicians feel they share the same values as the physician, and are more willing and able to pay for their treatment. Miller (1978) reports that the poor are considered the least desirable patients because they are believed to be "dirty and smelly, follow poor health practices, fail to observe directions and keep appointments, and live in a situation that makes it impossible to establish appropriate health regimes" (Miller, p. 457).

An argument often presented to counter the structural or systems-barrier approach that the poor have less access to medical care is that the poor do have the highest rates of physician visits per year, a measure of system utilization. The argument is that since the poor have higher rates of physician utilization, the system cannot be inaccessible to them. According to a Public Health Service Report, "Health, United States, 1988," (1989), the number of physician contacts per year for persons with a family income of less than $10,000 in 1987 was 6.8, while for persons with a family income of $35,000 or more, the number of physician contacts per person was 5.4. What this argument neglects to consider, however, is that a disproportionate number of persons in the lowest income group are over 65 (Williams, 1990). Most of these persons have Medicare coverage, and since many have multiple chronic illnesses, have greater needs for medical care. When the need for services is considered among the different income groups, the poor do receive fewer services than the wealthy. In addition, the attenuation of the relationship between income and use of medical services has been due primarily to a decreasing average use by high income persons (Williams, 1990).

The growth of corporate medicine in the U.S. has contributed to the differential access to health care (Freund and McGuire, 1991; McKinlay and Stoeckle, 1988). As large health care corporations have become central elements in the system, there has been a change in ownership and control of the medical system to include more for-profit components (Freidson, 1986). These for-profit chains are not interested in treating people who cannot pay. They do not wish to locate their hospitals in poor areas with large numbers of Medicaid patients. They aggravate the already gross geographical distribution of physicians in the U.S. who have chosen not to locate in rural and inner-city areas (Starr, 1982).

One study, conducted by Rawlings and Weir (1992), may well serve to demonstrate the connection between health status and access to health care. The disparity in infant mortality rates between black and white infants (the rate for black infants being twice that of white infants) has been attributed in large part to the higher incidence of poverty and limited access to health care among black Americans. These researchers investigated race and military rank-specific infant mortality rates among dependents of military personnel. The nationwide infant mortality rate for black infants in 1987 was 17.9, while for black infants of military personnel the rate was very close to that of whites, 11.1. The researchers concluded that the lower rates of infant mortality among dependents of black military personnel, as compared to nationwide rates, was due to guaranteed access to health care and higher levels of family income of the military subpopulation.

The Health Care System of the United States

The system of health care delivery in the U.S. is described by Freidson (1970) as a professional model with an emphasis on fee-for-service and professional autonomy. The primary actors in the health care system of the U.S. are the physicians. In order for the occupation of physician to be considered a profession, thus defining the system of health care delivery as a professional model, Freidson (1970) suggests that three necessary conditions be met: (1) the occupation has gained command of the exclusive competence to determine the proper content and effective control of performing some task; (2) the occupational group is the prime source of the criteria that qualify a person to work in an acceptable fashion; and (3) the general public believes in the consulting occupation's competence in its professed knowledge and skill. The occupation of physician has met these conditions; thus one can define the system of health care delivery as a professional model.

The national system of health care in the U.S. is described as a system comprised of individual practitioners and facilities organized in a loose network within which services are provided (Kurtz and Chalfant, 1991). Facilities within the health care system include hospitals, clinics, insurance companies, pharmaceutical companies and other ancillary organizations, and can be under the auspices of either public (federal, state, or county) or private control (Glaser, 1986). Just as physicians are the primary actors in the practitioner component of the health care system, hospitals are the primary institution in the facilities component. In the U.S. today, most hospitals are under private control (Freidson, 1986). While each of the components within the loose network functions as an independent agent, all the components are nonetheless interdependent. Due to their specialization of functions, each component depends on the others for referrals and consensus in decision making which can affect all parts of the system (Kurtz and Chalfant, 1991).

The health care system in the U.S. is based on a fee-for-service market philosophy. Under a fee-for-service orientation, all members of the system levy a charge for each service in their specific practices. The charge set by the individual practitioners and facilities is based on economic market forces. Since individual practitioners are not controlled by strict fee schedules, they can set their charges sufficiently high to cover the costs of practice, depreciation of equipment, repayment of debts, while realizing profit (Glaser, 1986).

Professional autonomy refers to the monopoly that the profession has over the exercise and control of its work. The medical profession has control over the quality and terms of medical practice, and its members are free to practice with very few formal constraints not of their own making. The profession has been able to maintain control over its markets and other organizations that affect its interests (Freidson, 1970; Starr, 1982). This professional autonomy was allowed to develop due to the distinctive type of dependency condition which exists between members of the medical system and those who purchase the services of the system. The members of the medical system possess knowledge of illness and treatment which is considered to be authoritative and definitive. This knowledge is completely unknown to those not in the system, thus they must defer to the judgment of the health care professionals. The superior competence and expert authority attributed to the members of the system have gained them preeminence and autonomy in the field of health care (Freidson, 1970; Starr, 1982).

The professionals in the health care system remain free from lay interference, thus maintaining both socioeconomic and technical autonomy over their work. The one organization which has been able to gain control over this loose system is the American Medical Association (AMA). The AMA is a private national organization whose influence extends beyond its physician members. It has been described as exerting the greatest single influence on the organization of medical care in the U.S. (Freidson, 1970). The power of the AMA is rooted within the local community through membership in the local medical societies. While membership in the AMA is critical to the career of the physician or individual practitioner, compliance with AMA policies is critical to all other occupations and organizations within the health care system. The AMA is influential in setting and promoting the technical standards of all health care services, occupations, and organizations. It has been able to successfully eliminate competition, and has continued to maintain professional control over the administrative, review, and sanctioning functions connected with health care in the U.S. (Freidson, 1986).

Not only are the professionals in the health care system free from lay interference, but they are relatively free from governmental or state interference as well. The state has also left in the hands of the profession control over the technical side of its work, and for the most part its members fees and schedules. It is, in fact, through the interactions of the agents of the medical profession and the officials of the state that this control has been established and shaped (Freidson, 1970; Kurtz and Chalfant, 1991). The formal representatives of the medical organizations have been remarkably successful in directing the efforts of the state to make policies which are desired by the medical community, and in assuring that the interests of the community prevail in political decision making (Starr, 1982).

While the state does have ultimate authority in matters of licensing and prosecution of health care professionals, Friedson (1970) argues that much of the authority has in fact been given to the AMA because decisions concerning these matters are based on the advice of the AMA. Freidson (1970) also points out that all states require that a physician be a graduate of an acceptable medical school in order to practice in that state. While a state medical examining board is given the task of determining which schools are acceptable, the criteria for acceptability are those standards that are approved of by a joint committee of the AMA and the Association of American Medical Colleges. Additionally, the state officials who sit on the state boards are nominated by representatives of the local medical societies.

In a more recent analysis of the health care system, Freidson (1986) says that despite recent changes in the organization of the health care system, specifically the rise of for-profit enterprises owned and operated by investors, the medical profession has retained its basic monopoly over the key functions of health care, including control over the nature of its work, and the ability to supervise, review, and evaluate its work. The criteria by which the technical work of health care professionals are judged continue to be established by the members of the profession. The formal review bodies continue to be dominated by the members of the profession.

A National Health Service

If access to the health care system in the U.S. is determined by structural barriers present within the society, it may be possible that a structurally different type of health care system which provides universal access would positively affect the health status of the members of that society. One alternative health care system is a national health service.

The institution of a national health service would create a different organizational structure with the intent to create a centralized coordinated system of health care. Waitzkin (1989) suggests that the basic principles of a national health service include:

(1) The provision of comprehensive care, including diagnostic, therapeutic, preventive, rehabilitative, environmental, and occupational health services; dental and eye care; social work; and counseling services;

(2) Services that do not require out-of-pocket payments at the point of delivery;

(3) Financing accomplished through taxation of individual and corporate incomes;

(4) Initiation of public health programs, including prevention, risk reduction, maternal and infant care, occupational and environmental health, and long-term services for the elderly;

(5) Improvement of geographical distribution by providing free physician education and training in return for required periods of service by medical graduates in underserviced areas;

(6) Local advisory councils comprised of elected community representatives and provider groups who

work together in quality control efforts, planning, and feedback.

Theoretically, a national health service would provide universal entitlement to health care services through the elimination of the necessity of having the requisite resources to access the system. Since it would all but eliminate private profit, regional variation in the number of physicians and distribution of hospital beds is reduced (Hollingsworth, 1981). Medical care services would be delivered uniformly to all members of society, and quality of care would be uniform across the society (Hollingsworth, 1981).

The Health Care System of Great Britain

The National Health Service of Great Britain is a structurally different health care system than the professional fee-for-service health care system of the U.S. The NHS emphasizes centralization of services and universal access for all citizens. It is a system based on socialist economic values and theories of social justice, values which attempt to remove economic factors from the health marketplace (Kurtz and Chalfant, 1991). According to Gill (1990), the basic principles of the NHS are universality, equity, and public accountability. Universality means that medical and health care services are delivered uniformly to all members of society. Equity means that the quality of services are uniform throughout the nation, and no one is barred from access to them. Accountability means that the system must answer to the population it serves, rather than to the profession of medicine. The autonomy of the medical industry and its physicians is limited by government control.

The NHS is a public rather than private system of health care delivery, where control of hospitals, clinics, physicians, and other medical care services is under the Ministry of Health of the British Government. Hospitals and clinics are owned by the government, and the majority of physicians are employed by the government. The NHS is financed by tax revenues, with essentially no cost to the patient at the point of delivery of services (Hollingsworth, 1981). Each year, the Department of Health submits a budget to Parliament for consideration. Parliament then accepts the budget as submitted, or revises and then accepts it (Kurtz and Chalfant, 1991).

A general practitioner is the initial contact for citizens entering the health care system. Primary medical care is provided by this family physician to his or her registered patients. Individuals can register with a general practitioner of their choice, as long as the physician is willing to accept them as part of his or her patient load. This primary care physician then becomes the only option available to the patient within the government system of free care. Access to specialized care and to hospitals is obtained only through referral from the primary care physician (Kurtz and Chalfant, 1991). There does exist a private element in the system and the patient able to afford private insurance is able to select the physician of his or her choice, and also to decrease the waiting time for elective services. Due to the rationing of elective services in Great Britain, patients often must wait two or three years for elective care (Gill, 1990).

One major difference between a NHS and a fee-for-service system is that the NHS is able to control the geographical distribution of hospitals and physicians. As the NHS owns all hospitals, it is able to build hospitals and allocate resources where they are needed, rather than where insured patients are. Physicians, though employed by the NHS, are not assigned locations in which to practice. Employment possibilities are eliminated in areas that are overserved, and incentives are offered to locate in underserved areas (Gill, 1990).

A summary description of the British National Health Service is as follows:

(1) Within a welfare state philosophy, the government has established the National Health Service (NHS) to administer a national medical care system.

(2) Medical care is provided without direct cost to the patient.

(3) Medical and other health services are readily available at the point of entry all people.

(4) First contact in the system is usually with a generalist in an office or clinic who makes a decision about whether the patient needs the services of a hospital-based specialist.

(5) Although much emphasis is placed on preventive care in the society, mass screening and routine physical examinations are not strongly supported.

(6) Care of patients in their homes rather than in hospitals is emphasized (Fry, 1969).

According to the World Health Organization, in Great Britain, "all of the population have access to treatment by family doctors and dentists, to the dispensing of prescribed drugs, to ophthalmic services, and to community nursing and health visitor services" (World Health Organization, 1987, p. 211).

The NHS was introduced in Great Britain in 1948, but there was already a history of state programs which had both improved access to medical services and increased centralization of those services. Concern for the health of the citizenry was first directed toward children when, in 1907, state medical inspection of school children was introduced. By 1920, every school child in Britain was assured of at least three inspections by age 15. In addition, any parent who could not afford to pay for his or her child's medical care was assisted by the local government. Medical care from the state was provided to the elderly with the passage of the Old Age Pension Act in 1908. In 1918, Parliament urged local provision of maternity clinics and infant welfare programs and by 1938 over half of the pregnant women in Britain received free care. As a result of the active support and involvement of a strong labor movement, the concept of social insurance was pioneered by Britain in 1911. Compulsory sickness insurance, or a national health insurance, was provided by the state for low income working people who had no insurance (Hollingsworth, 1981). It was this involvement of labor in Great Britain in support of the working class, and the lack of a similar involvement in the U.S., that some believe charted the eventual course the two countries would follow in regard to their attitudes and actions toward the delivery of health care (Navarro, 1989; Starr, 1982).

During its 45-year history, the NHS has eliminated financial barriers to access, made the system more rational and equitable, provided care on a community level with community based primary physicians, maintained a high level of medical care quality, and controlled costs (Gill, 1990). In 1985, Great Britain spent 6.1% of its gross national product (GNP) on health care, and 6.2% in 1986. By comparison, the U.S. spent 10.7% of its GNP on health care in 1985, and 11.1% in 1986 (Health United States 1987, 1989). In 1987, Great Britain spent 6.1%, and the U.S. spent 11.2% (Demographic Yearbook 1988, 1990). The centralization of the medical delivery system in Great Britain has resulted in equality across regions, social classes and groups (Hollingsworth, 1981).

Theoretically, it could be postulated that this equality in access would bring about equality of results, and there would be a convergence in levels of health status across social classes. If true, then the class bias in levels of health status found in the medical system of the U.S. would be reduced by the institution of a system similar to that in Great Britain.

Recent data from Great Britain have revealed that the overall health status of all British citizens has improved since the development of the NHS (Williams, 1990). While overall health status has improved, some studies have suggested that inequalities in morbidity and mortality by social class continue to exist and have not been reduced (Marmot et al., 1987; Smith, 1990).

On August 20, 1980 the Department of Health and Social Security in Great Britain released a report of the Research Working Group on Inequalities in Health. Known as the Black Report, this longitudinal study dealt with official statistics of England and Wales focusing on mortality rates and life expectancies over 25 years. It had been expected that the introduction of the NHS would eventually lead to the elimination of the SES gradient in health status. On the contrary, data revealed that SES differentials in Great Britain (England and Wales) had not decreased. For all seven diseases for which data were available (leukemia; cancer; malignant neoplasms of the lungs, bronchitis, and trachea; hypertensive disease; diabetes; bronchitis; and respiratory tuberculosis) mortality rates between the upper and lower classes had not narrowed. With the exception of bronchitis, the gaps had in fact widened (Hollingsworth, 1981). The central finding of the study was that there were large differentials in mortality and morbidity that favored the higher classes. Social class was found to be the single most powerful predictor of morbidity and mortality in the course of a lifetime. Poverty remained the principal cause of premature death and shorter life expectancy of the lowest classes (Townsend and Davidson, 1982).

The _Whitehall Report_, a longitudinal study published ten years after the _Black Report_, followed up a sample cohort identified in 1971. This study looked at class gradients in only one occupation, the civil service, in order to eliminate confounding variables that could result from use of different occupations. The report showed that compared to men in the highest grade (administrators), men in the lowest grade (unskilled workers) had three times the mortality rate from all causes, especially coronary heart disease, but including lung and other cancers, cerebrovascular and other cardiovascular disease, chronic bronchitis and other respiratory disease, and gastrointestinal disease. The report concluded that: (a) social class differences had widened; (b) better measures of socioeconomic position showed greater inequalities in mortality; (c) social class differences existed for health during life as well as for length of life; and (d) trends in the distribution of income suggested that further widening of mortality differentials may be expected (Smith et al., 1990). Class mortality differentials presented were considerably greater in the Whitehall Report than those revealed in the Black Report (Morris, 1990; Smith, 1990).

Social class differentials also continued to persist in rates of infant mortality. As in the U.S., there has been a steady decline in infant mortality rates. However, those in the lower classes continue to have rates higher than those in the wealthier classes (Humphrey and Elford, 1988; Pamuk, 1990; Rutter and Quine, 1990). In 1984, for example, the infant mortality rate for the highest social class was 6.5, and for the lowest was 13.0 (Carr-Hill, 1988).

An explanation of these inequalities is that members of the lower classes have been found to engage in high risk health behaviors such as smoking (Morris, 1990; Smith, 1990; Smith et al., 1990) and exercising less (Morris, 1990) than do members of the upper classes. Goldblatt (1990) found an association of poverty and ability to access the system, even though there is universal access to the health care system in Great Britain. He found that not having access to a car was the single most important factor in the association of mortality rates and social class, with those in the lower classes not having access to a car far more frequently than those in the higher classes.

Inequalities in mortality by social class exist in Great Britain, and in fact have appeared to have widened and become more striking since 1950 (Carr-Hill, 1988; Hart, 1986; Marmot et al., 1987; Smith et al., 1990; Smith, 1990; Whitehead, 1987). Despite an NHS, social inequalities in access to, use of, treatment by, or benefit from the health service persist in Great Britain (Marmot et al., 1987; Susser et al., 1985; Williams, 1990).

Conclusion

The review of the literature has indicated that two major explanations have been offered to explain the positive association of SES and health status in the U.S. today. One is that members of the lower classes engage in health risk behaviors such as smoking, drinking alcohol, avoiding exercise, practicing unhealthy dietary habits, and getting fewer hours of sleep more frequently than do members of the higher classes. The second explanation is that there are structural barriers present in the society, primarily the necessity of having financial resources to access the health care system, which negatively affect members of the lower classes in obtaining adequate medical care. The health-risk behaviors may exert an independent effect on health status, or may mediate the relationship between social class and health status. In either case, the strength of the relationship among social class, health behaviors, and health status deserves examination, in addition to examination of the relationship between social class and health status alone.

The review of the literature also shows that a number of authorities believe that a structurally different type of health care system to the professional fee-for-service system in the U.S. today may help reduce the strong positive association of socioeconomic status and health status. One such structurally different type of health care system is the National Health Service of Great Britain. What has not been examined in the literature is a comparison of the relationship between SES and health status in each country. While it has been found that there is a positive association of SES and health status within each country, a comparison of the strength of these associations across countries has not been attempted. We have no definitive answers as to whether the positive relationship between SES and health status is weaker in a society with an NHS than in a society without an NHS. It remains an open empirical question, of importance to citizens and policy makers alike. The purpose of this study is to examine the SES-health status relationship within each country, and compare them across countries, in order to address this question.

CHAPTER 3
THEORETICAL FRAMEWORK

Introduction

In order to develop an hypothesis for dealing with the issues of comparing two forms of health care systems, it is necessary to explore the theoretical framework from which the hypothesis may be derived. In this chapter, the theoretical framework from which the hypothesis of this study was derived is presented. In addition, this chapter includes a discussion, from a socio-historical perspective, of why the theoretical framework utilized offers the best explanation of differences in health care systems and system outcomes.

The relationship of macro social structures to rates of individual behavior has long been a concern of sociological theory. This inquiry seeks to explain the consequences of a particular set of institutional arrangements on groups of individuals (Inkeles, 1959).

The macro perspective, or structural theoretical perspective, focuses on the relationship between social structure and rates of behavior. It will be the basis upon which this study will examine the association of social stratification and health status.

This study will use a structural perspective as the theoretical and analytical framework in which to understand the persistent association between SES and health status. It will allow the evaluation of whether the ability to access the health care system can help explain the relationship between socioeconomic status and health status. This theoretical perspective posits that the system of health care delivery (whether or not there is an NHS) is a structural attribute, and change in part of the structure will influence change in outcome. The system of health care delivery is a structural attribute of the society in which it is found, thus is a creation of that particular structural arrangement. The outcome of the health care system, i.e., health status, is a consequence of that arrangement. Williams (1990) states that the macro perspective:

> Predicts that because social structures shape individual values and behaviors, SES differentials in morbidity and mortality are due at least in part to conditions of life that derive from an individual's structural position. Consequently, adequate understanding of the social status-health relationship is contingent on the theoretical identification and the empirical verification of the links between social structure and health outcomes. (p. 81)

The indication here is that the health status of the members of a society will vary according to the structural arrangement of the society, and an individual's position within that society.

The literature reviewed for this study pointed to two factors which may be considered as critical links in the relationship between social structure and health status. These are (1) access to health care and (2) awareness of proper health behaviors. Engagement in health preventive behaviors is viewed not as an individual characteristic, but rather as the patterned response of social groups to the realities and constraints of the external environment (Williams, 1990). The ability of social groups to access medical care is a consequence of the system of health care delivery of the society, determined by the particular structural arrangement of the society. In this study, a comparison of health status will be made between members of a society for which the structural arrangement of the health care system has created financial barriers to access the system, and those for which financial barriers to access have been eliminated.

The review of the literature revealed that SES is an important correlate of health status. Engagement in health promotion behaviors and the ability to access the system of health care delivery were found to be linked to social status, and also to health status of individuals as members of social groups.

The Conflict Perspective

The conflict approach in sociology is a structural theoretical perspective which allows examination of how the respective structural arrangements of the health care systems of the U.S. and Great Britain affect health status outcomes. The conflict perspective is based on two general assumptions: (1) health is a highly valued resource and tends to be distributed unequally in society, and (2) competition over this scarce resource shapes a health care system.

While the economic structures of both the U.S. and Great Britain follow a free market system, a primary distinction between the two systems is the ownership of the resources used to produce health services. In Great Britain, the state owns the resources of production, while in the U.S., the resources of production are privately owned. The U.S. treats the scarce resource of health care as a "private good" and relies on the market system for the production and distribution of this resource. Great Britain, on the other hand, treats the scarce resource of health care as a "public good" and the production and distribution of this resource are pursued by the government, bypassing the free market system, and employing a command system. In a command system the government exercises primary control over decisions concerning what goods and services to provide, and in what quantities to provide them.

In the free market system questions concerning what goods and services and how much to provide are decided on a open market through the competitive forces of supply and demand (Spencer, 1990).

Normand (1991) suggests that the reasons why health care is viewed by some as a public rather than private good are threefold: (1) health plays an important role in an individual's ability to enjoy many aspects of life, (2) there is extraordinary suffering that can accompany the need of health care services, and (3) there is great uncertainty about when an individual will need medical care. The most important feature of treating a service as a public rather than private good is that no one can be excluded from using the service, regardless of whether or not he or she can pay (Spencer, 1990). The basic idea is that essential goods, such as health services, should take more account of need than of income as the basis of access (Normand, 1991).

The treatment of health care as a "public good" in Great Britain is a result of the strength of the working class and socialist political parties in the 1900's (Navarro, 1983). Support for universalism, the entitlement of all members of a society to the resources of that society, is a basic component of socialist philosophy. In an analysis of all developed capitalist countries, Navarro (1989) found that the establishment of a national health program was related primarily to the establishment and influence of the labor movement within that country, which was realized through labor's economic (unions) and political (socialist party) sectors. On the other hand, a weak working class and labor movement, in combination with a strong capitalist class, was found to encourage a "private good" system of health care where emphasis is placed on voluntary membership, benefits closely connected to one's contributions, meager public benefits, and standards to encourage private insurance alternatives. Navarro (1989) found the health care system of the U.S. to be unequaled by any other western capitalist country in the provision of such a "private good" system of health care delivery.

A Socio-Historical Discussion

Paul Starr (1982) and Vicente Navarro (1989) believe that it was the strength of the organized labor movement in Great Britain which led to the creation of the NHS. Political dissent created through labor's socialist parties, and labor unrest supported by the economic strength of the labor unions, preceded the introduction of social insurance. Navarro (1989) argues that socialist working class parties have as a major goal the fight for universalism within the society. The national health service, with its emphasis on universal access to the system, was a consequence of the workers' socialist movement in Great Britain in the early

1900's. The compulsory sickness insurance instituted in Great Britain in 1911 was part of a general program of social insurance against risks to the continuity of workers' income. The insurance protected workers against industrial accidents, sickness and disease, old age, and unemployment. Thus, the original function of health insurance in Great Britain was that of income stabilization for the workers, and it was insured by the state (Starr, 1982).

In contrast, the labor movement in the U.S. was not a socialist movement. Labor did not encourage the development of social welfare programs by the government for fear workers would become more loyal to the government than to the unions (Starr, 1982). The unions in the U.S. were fighting for their own power and influence, rather than coordinating efforts to better the working class as a whole. Without the centralized strength of one economically and politically related interest group to represent them, the working class in the U.S. had no one to fight for programs of universal entitlement. In 1914, there was a movement by a private voluntary action group, the American Association for Labor Legislation, to institute state-sponsored health insurance for workers. Strong opposition came from the American Medical Association, which by this time was an influential organization of physicians with strong political associations. The AMA fought to defend the income and autonomy of those they represented. Joined by the private insurance industry, which recognized that the institution of state sponsored health insurance would be contrary to its interests, both organizations played active roles opposing any social reform of the system. Against this organized opposition, reformers who attempted to introduce social welfare policies were defeated. The movement, which had begun by social reformers to institute national health insurance, died by 1917, falling victim to the work of special interest groups (AMA and insurance industry) and lack of support from labor representing the working class (Starr, 1982). In addition, the entry of the U.S. into World War I against Germany in 1917 exacerbated anti-German feelings, including the denouncing of the German socialist health insurance system (Starr, 1982).

In the early 1930's, President Franklin Roosevelt supported the inclusion of a health care insurance amendment to the Social Security Insurance Bill which was to go before Congress. In 1935, the AMA announced its opposition to the inclusion of the amendment, and the President became convinced that the health insurance amendment would cause the defeat of the entire bill. Thus the health care insurance amendment was omitted from the Social Security Insurance Bill. This defeat would mean that health insurance in the U.S. would be predominantly private in nature. In 1943, Roosevelt again supported a national health insurance plan, and the AMA again opposed such a plan. With Roosevelt stating that "we can't go up against the State Medical Societies; we just can't do it" (Starr, 1982, p. 279), the AMA was once again able to successfully defeat the challenge of national health insurance.

President Harry Truman, who was strongly committed to a plan of national health insurance, advanced a proposal for its adoption in 1949. His single health insurance system would include all members of society, not just the needy, and the comprehensive and universal features of his program were central to its identity (Starr, 1982). Again, opposition from the AMA, with the support of big business, was able to defeat the proposal. At this same time, there was a crusade in the U.S. against any communist influence, and the institution of a socialized medical system had little public support. According to Starr (1982), the idea of a national health insurance system in the U.S. was defeated at this time for three major reasons: (a) strong negative feelings about the political ideology of Germany and the Soviet Union, which included their socialized medical systems; (b) the cooperation of big business with the AMA, and agreement that national health insurance was in opposition to both of their interests; and (c) the imbalance in material resources of the AMA and government. In 1950, the government's Committee on National Health Insurance had a budget of $36,000 to garner support for national health insurance, while the AMA spent $2,250,000 in opposition (Starr, 1982).

There was, however, a need for medical insurance as rising hospital costs threatened the access of middle class persons to the system. The defeat of a national health insurance program opened the door to private systems, and Blue Cross and commercial insurance companies grew and flourished. Labor unions at this time were attempting to secure power for themselves by taking power away from industry. One way to gain power was to offer health insurance coverage to members as part of an overall benefits package (Starr, 1982).

In 1970, with the support of Walter Reuther, President of the United Auto Workers, Massachusetts Senator Edward Kennedy and Michigan Representative Martha W. Griffiths introduced a comprehensive program of free medical care--a federally-operated health insurance system. President Nixon countered with a new national health strategy which introduced the concept of health maintenance organizations (HMO). The AMA and insurance industry adamantly opposed both proposals, and an attempt at a compromise was presented by Sen. Kennedy and Arkansas Rep. Wilber Mills. This compromise would have allowed private insurers to be part of the program. The labor unions refused to accept the compromise, now insisting on the original comprehensive program of free medical care. Without the support of labor, a compromise had no chance, and again a vision of a national health care program vanished (Starr, 1982).

Historically, the value system of America differs from that of Great Britain as it relates to the provision of medical care. According to Cockerham et al. (1988), except for the aged, a governmental welfare system is not considered normative in the U.S. The dominant value regarding the medical system is that it is a commercial entity, in which medical services are viewed as a commodity (Cassal, 1986). While Great Britain, like the U.S., is a market economy, the history of governmental responsibility to all citizens found in Great Britain has not developed in the U.S. The ineffectiveness of the labor movement to represent the working class in the fight for social reform over the last eighty years has left the working class without the political and economic support needed to change the structure of the system. This legacy continues today. Pescosolido et al. (1985) compared eight industrialized market economy nations on their public's evaluation of governmental responsibility for health care. They found that the public in Great Britain negatively evaluated government's performance if it believed the government was taking less responsibility for providing health care. In the U.S., the survey respondents did not negatively evaluate the government's performance if they believed the government was taking less responsibility for providing health care. This suggests that the people of Great Britain value social responsibility to provide health care for the members of that society. Americans value individual responsibility for one's health status over that of social responsibility and hence do not blame the government for failing to provide what they do not think it should provide anyway. Americans have allowed the government to reduce welfare spending, which has most significantly affected the unemployed and low income working class. Recent health policy in the U.S. has stressed cost reduction and market competition over quality of care and equal access (Bodenheimer, 1989).

In addition to the weakness of the labor movement and socialist parties in the U.S., the strength of the medical system and the institutional arrangements that structure the health care system in the U.S. continue to permit and encourage medicine to operate as a business and a private good. Medical care in the U.S. today is undergoing a transformation in its institutional structure toward a "medical-industrial complex" where profit-making corporations are gaining domination (Starr, 1982). Large health care corporations are becoming a central element in the health care system, thus there has been an increased penetration of profit-making firms into medical services. This change has been particularly evident in the ownership and control of hospitals, where for-profit chains have accounted for much of the recent growth in hospital beds (Starr, 1982). Consequences of this change for society are that these hospitals have incentives to admit patients not needing hospitalization, to overuse technological services that receive high reimbursement, to duplicate expensive equipment as costs can be recovered through insurance, to not want to own hospitals in depressed areas, and to prefer serving only privately-insured patients (Starr, 1982).

Profit-making hospitals benefit from reimbursement by private health insurance. As such, a private corporate sector in health care would not be interested in the formation of any type of national health care system; nor will it improve inequalities in access to health care. Starr (1982) believes that the two-tier system of medical care present in the U.S. will become more conspicuous as profit-making enterprises are not interested in treating people who can not pay. Health care is becoming controlled by conglomerates whose interests are determined by the rate of return on investments and by private rather than public regulation. The growth of corporate medicine promotes medical care as a private good.

The rise in for-profit enterprises owned and operated by investors, and the entry of management organizations and large, powerful corporations into the health care system, have created the "corporate practice of medicine" (Freidson, 1986). One element which is peculiar to the American medical system has been the ability of the medical profession to exert an extraordinary amount of power and control over the medical system (Freidson, 1970). Even with the advent of corporate medicine in the U.S., physicians still hold authority and strategic positions in the system. The for-profit hospitals owned by corporations remain concerned with being attractive to physicians, as physicians are those who bring in the patients. As a result of this concern, a new trend has developed where members of the medical staff are offered seats on the governing boards of these for-profit hospitals, and are co-opted as shareholders with a financial stake in the hospital (Freidson, 1986).

In the last few years, there has also been change in the organization of physician practices, with more physicians entering into group practice and organizations which afford them more personal time. More than half of office physicians in the U.S. today are organized in partnerships and in single or multispecialty groups; many individual physicians have become professional corporations in order to insulate themselves from financial risks and to take advantage of favorable tax laws (Glaser, 1986). The AMA is not opposed to the corporate practice of medicine, and would be opposed only to interference by organizations in medical decision making. The AMA remains satisfied that none of the forms of corporate practice threatens professional autonomy (Starr, 1982).

Physicians, represented by the AMA, and with little governmental interference, have developed a control of medical practice and a professional dominance with almost complete functional autonomy. As a result, they have "cornered the medical market" and controlled decision making regarding the fate and future of that market. It is unlikely to expect that this group, with the support it has from the insurance industry, the American Hospital Association, and medical schools, would choose to relinquish the economic success and professional autonomy it enjoys to encourage the development of a national health service.

As self-employed small businessmen, physicians prefer to serve customers who can pay. Higher prices can be charged for more time and resource consuming services. The physician has an incentive to perform more complex treatments, and to substitute more technically specialized work for less specialized work. Thus, they are motivated to avoid primary-care work as it yields a lower income for the practitioner. As physicians become more and more specialized, they prefer customers who can afford their fees, and they have tended to cluster in geographical areas containing the largest number of paying, including insured, patients (Glaser, 1986).

As part of corporate medicine, physicians are under pressure to adhere to some standard of performance, which is usually measured either by revenues generated or by number of patients treated per hour. If a physician does not keep up with the financial expectations of corporate headquarters, and fails to produce, his or her practice could be in jeopardy or his or her contract may not be renegotiated (Starr, 1982). In either case, whether a physician be self-employed, or part of a corporation, market concerns are a priority.

Consequences of this system have been that high quality medical care is available to part of the population, while others do not receive basic care, and that medical decision making may be tied to the physician's ability to profit from the patient's insurance status or the patient's ability to pay. For example, one study found that when physicians personally profited from tests and x-ray procedures, they subjected their patients to more tests than did physicians who did not personally profit from such procedures (Hillman et al., 1990). There is also evidence which has suggested that surgeons have been overutilizing coronary bypass surgical procedures which have benefitted neither the patient nor physician, and may in fact have been unnecessary (Winslow et al., 1988; Varnauskas and the European Coronary Study Group, 1988). Another study comparing three common yet expensive surgical heart procedures reported that these surgeries were done more frequently for patients who had medical insurance than for those who did not. The conclusion of the study was that either unnecessary surgeries were performed on patients who could afford them or that necessary surgeries were not performed on patients who could not afford them (Wenneker et al., 1990).

The AMA (Tupper, 1990) and the American Academy of Pediatrics (AAP) (Harvey, 1990) have developed proposals for health care reform to increase access to the medical system for poor Americans, yet the basic principle of both proposals remains employer-based insurance coverage. Employers would be required to provide medical insurance to all workers and dependents, with employees paying a portion of the premium based on their salary. For the unemployed, the AMA suggests the enactment of major Medicaid reform, where coverage would be extended to all those at 100% of the poverty level. The AAP recommends a revision of the system in which each state would contract with private insurers to provide coverage to those with no employers, and the insured would pay a sliding scale premium based on their respective income levels. Each of these proposals retains the professional model, with fee-for-service and professional autonomy. Commercial insurance carriers remain an integral part of the system, and the corporate medical system could be accommodated as well. The structure of the medical system would not change, and part of the financial burden would remain on the employee. Benefits offered by employer coverage would vary, dependent upon the ability of the employer to afford it, and equal quality of care would not be extended to all. The same would be true of the Medicaid or contract system, where deductibles would remain in effect, and coverage would vary based on state funding.

In the market system of the U.S., the price of services determines who gets the services. Those willing and able to pay the price of the service get that service, while those unwilling or unable to pay the price do not get the service (Mansfield, 1992). In the market system, health care is viewed as a private good, a service which is sold on the market to those who can afford it. Anyone who is not willing or able to pay for the service is excluded from its use. There are, however, examples of services in the U.S. which are delivered as public goods through a command system. The armed forces, which provide social defense and the police forces which provide social safety are two such examples.

When defined as a public good, provision of health care is handled as an obligation of society rather than as a profit-making, competitive business on the free market (Navarro, 1989). Where the economic arrangement within the social structure fosters an obligation and duty to care for citizens, a system develops which does not treat health care as a scarce resource but as a right of citizenship. In contrast, the structural arrangement of society in the U.S. encourages medicine to operate as a business with emphasis on competition and profit (Starr, 1982).

Summary

In the U.S., health is treated as a private good and competition has developed over the provision and consumption of that resource. Consumers with the ability to purchase the good (health care) will acquire the product or outcome (high health status). Those without the ability will not. Consumers of health care in the U.S. are stratified according to their ability to purchase the good. Income affects health outcomes by affecting the amount of consumption items (medical care) that people consume. In Great Britain health care is not a product for sale on a medical market, thus the ability to purchase the product is not subject to stratification or SES. The consumers of health care in Great Britain may benefit from the outcome of the product (high health status) regardless of SES.

It is the treatment of health care as either a private or public good which affects the relationship between SES and health status in each society. According to the conflict perspective, when health care is treated as a private good it becomes available to some members of the society based on their ability to purchase the resource. The ownership of the means to purchase health care (either money or health insurance) will determine the outcome, or level of health status.

Those who cannot afford to compete for the scarce resource of health care in a social system where there is no competition for that resource on the medical market (Great Britain) will be able to acquire the outcome, or high health status. Those who can not afford to compete for the scarce resource of health care in a social system where there is competition for that resource on the medical market (U.S.) will not be able to acquire the outcome.

The Functionalist Perspective

It is recognized that use of the conflict theory is not the only one useful to understanding differences in health care systems and health outcomes. Functionalist theory also helps fuel the expectation that SES and health status are more related in the U.S. than in Great Britain. It could be argued the differences in health care systems found in societies are functional for that society. For example, in the U.S. the health care system reinforces the favored view of a capitalist economic system where health care is treated as a private good. It also reinforces a value system which states that those members of the society who work hard will be rewarded. In the case of health care, the members who work hard are rewarded by salaries adequate to purchase health care, or benefit packages which offer medical insurance. There is an incentive, therefore, to work and be productive, for those are the members of the society who will enjoy high health status. In addition, those who work in the most valued positions in the health care system, the most capable members of the society (physicians, developers of medical technology) are substantially rewarded with wealth, prestige, and power.

The functionalist perspective can also be utilized to explain why the health care system in Great Britain is functional in that society. Both the U.S. and Great Britain are industrial capitalist societies, and as such need productive, healthy work forces in order to keep the society functioning. In Great Britain, however, in order to insure as healthy a work force as possible, delivery of health care has become a responsibility of the government, viewed as a public good. It becomes beneficial for the society as a whole to have the government provide a healthy work force to keep the society functioning.

The Hypothesis of the Study

Based on the literature review conducted, and the theoretical perspective utilized, the hypothesis of this study is: The relationship between SES and health status will be stronger in a country without a national health service than in a country with a national health service.

CHAPTER 4
METHODOLOGY

The Comparative Method

In a broad sense, all scientific research involves comparison. Individual units, groups, or cases are compared in order to discover answers to questions posed by researchers. In macro-sociology, the term "comparative" is generally used to refer to a specific kind of comparison: that of whole societies. It is the branch of sociology which attempts to explain social phenomena by citing cross-national differences and similarities (Ragin, 1981). In comparative research, two or more social systems are systematically compared in order to discover relationships which may be applicable across the societies. Comparative research examines differences in the same relationships found within two or more social systems (Ragin, 1981).

In this study, differences in a system level (systemic) variable, system of health care delivery, will be used to explain differences in health status both within and between two countries. It is hypothesized that the relationship between SES and health status will be stronger in a country without a national health service than in a country with a national health service. In order to test this hypothesis, it is necessary to compare the health status of a sample of the population of a social system with an NHS (Great Britain) with the health status of a sample of the population of a social system without an NHS (U.S.). In addition, this comparison will address the concern of whether the institution of a national health service would qualitatively improve the health status of all Americans.

In this research, a cross-national comparative study has been undertaken. In cross-national research, observations are made both of societies and of units (individuals) within the societies. A sample is drawn from each society to be studied, and measures of relevant variables are undertaken in each sample. Examination is then made of the degree to which the correlations between variables are similar or different across the societies from which the samples were drawn (Lee, 1982).

The utility of cross-national research is that it allows the assessment of cross-national differences in the explanation of social phenomena that could never be realized through single-nation studies. Cross-national research provides the most useful evidence to confirm social-structural explanations of social phenomena (Kohn, 1987). A structural explanation for SES differences in health status can not be revealed without the ability to compare societies which differ in some way at the structural level. The comparative method allows the comparison of different characteristics (system of health care delivery) of two social systems (U.S. and Great Britain), so that the effect (health status) of the differing characteristics can be explained. The advantage of comparative research is that it has the potential to expand the explanation and understanding of human behavior beyond that possible by research done within a single system (Lee, 1982). No analysis based solely on data from the U.S. can suggest whether the relationship between SES and health status within a fee-for-service health care system would be similar to or differ from that relationship under a different system of health care delivery. It is only possible to discover the nature of the relationship between SES and health status under different systems of health care delivery by comparing systems which differ to some degree at the structural level. It is that difference at the structural level which is hypothesized to affect the SES-health status relationship. In this study, the structural difference which is expected to affect the SES-health status relationship is system of health care delivery.

Selection and Comparison of Countries

At issue in this study is whether the organizational structure of a society, specifically the system of health care delivery, affects the levels of health status of the members of that society based on their position within the structure. In order to do this, two societies which are as similar as possible on all relevant dimensions except on the variable of interest were chosen. According to the logic of this method, the similar or common features of the selected countries are eliminated as explanatory variables, or those which help to explain the variation in health status by socioeconomic status. The features or dimensions on which the societies differ are then assumed to offer explanations for the variation. In this study it is suggested that the difference in the structural feature of the system of health care delivery will help explain the variation in health status by socioeconomic status.

When using the method of maximizing similarity, societies which are as similar as possible to one another on all dimensions except those of particular interest to the study are selected (Lee, 1982). Great Britain and the U.S. are class based stratified systems (Quine, 1990), are major western industrialized countries, are based on a capitalist economic structure, and have advanced systems of health care delivery (The Europa World Yearbook 1989, 1989). They are demographically, economically, politically, and culturally similar.

While the overall size of the populations of the two nations differ, distribution by age and gender are similar. In 1985, the year from which the data was obtained for each country, the population of the U.S. was 226,545,805; 51% of the population was female. The same year, the population of Great Britain was 49,923,500, with an identical 51% of the population female (Demographic Yearbook 1986, 1988). Table 4.1 describes the similarity in population by age distribution of the two nations in 1985. Thus, the two populations, while different in size, were composed of like age and identical gender groups.

Both the U.S. and Great Britain are considered major trading countries and international centers for business and financial services. Both are considered economically sound, due primarily to their extensive industrialization (The Europa World Yearbook 1989, 1989). The 1986 International Index of Industrial Production, which measures manufacturing and mining productivity, rated both the U.S. and Great Britain at similarly high levels (U.S. 101.1, Great Britain 102.3) when compared to an overall fixed rate of 100 (Statistical Abstracts of the U.S. 1990, 1990). The 1985 Manufacturing Output Per Hour, another measure of manufacturing productivity, also reported similar, and high, rates for the U.S. (115.9) and Great Britain (118.0), compared to an overall productivity rate of 100 (The World Almanac and Book of Facts, 1991). In 1985, major industries in both nations involved production and/or utilization of metals, minerals, electronics, and machinery (The World Almanac and Book of Facts, 1991). In 1985, major occupations in both nations were manufacturing, in which 21%

Table 4.1: Percent Population by Age, U.S. and Great Britain, 1985

	Age (in years)						
Country	<1	1-4	5-9	10-14	15-19	20-24	25-29
U.S.	1.6	6	7	7.2	7.8	8.8	9.1
Great Britain	1.3	5	5.9	6.8	7.9	8.3	7.2

	Age (in years)					
Country	30-34	35-39	40-44	45-49	50-54	55-59
U.S.	8.5	7.4	5.9	4.9	4.6	4.7
Great Britain	6.7	7.4	6.1	5.6	5.4	5.5

	Age (in years)					
Country	60-64	65-69	70-74	75-79	80-84	85+
U.S.	4.6	3.9	3.2	2.3	1.4	1.1
Great Britain	5.6	4.5	4.3	3.3	2.0	1.2

Note: Data from Demographic Yearbook, 1988, 40th Issue of the employed population of the U.S. worked, and 26% in Great Britain; trade, in which 21% of each nation's population was employed; social services where 32% of Americans were employed and 29% of British; and finance, where 10.3% of Americans, and 9.1% of British were employed (see Table 4.2) (1985/86 Statistical Yearbook, 1988).

The percent of the labor force employed is high in each country. In 1985, 92.9% of American and 88.1% of British citizens were employed (1985/86 Statistical Yearbook, 1988). In addition, labor force participation by age in each country is similar, as can be seen in Table 4.3.

In 1985, the mean U.S. household income was $22,646 (Statistical Abstracts of the U.S. 1988, 1988) and the mean household income in Great Britain, converted to U.S. dollars, was $13,105 (Annual Abstracts of Statistics 1988, 1989). These raw figures, however, tell us little about the purchasing power parity of the two societies. A more accurate comparative indicator is a measure of the respective economic welfare of the members of the two societies. The relative gross domestic product (GDP), a measure of the goods and services that an economy produces, can be utilized to compare the economic welfare of different nations. The GDP per capita (GDP divided by population) is considered to be an accurate comparative measure of a country's productivity, prosperity, and wealth as it shows how much of a country's output is available, on average, for

Table 4.2: Percent Employment by Industry, U.S. and Great Britain, 1985

	Major Division of Economic Activity		
Country	Agriculture/ Forestry	Mining/ Manufacturing	Construction
U.S.	3.1	21	6.5
Great Britain	2.6	26	6

	Major Division of Economic Activity		
Country	Trade/ Hotels	Transport/ Communications	Financing/ Insurance
U.S.	21	5.6	10.3
Great Britain	21	5.8	9.1

	Major Division of Economic Activity
Country	Social Services
U.S.	32
Great Britain	29

Note: Data from Demographic Yearbook, 1986, 38th Issue

Table 4.3: Labor Force Participation by Age, U.S. and Great Britain, 1985

Age Group	Percentage in Work Force U. S.	Great Britain
15-19	55.7	56.4
20-24	79.1	78.4
25-54	80.2	81.1
55-64	50.7	49.7
65+	8.5	4.9

Note: Data from Statistical Abstract of the U.S., 1987.

each man, woman, and child in that country (Ruffin and Gregory, 1993). For example, the GDP per capita (in U.S. dollars) for the U.S. in 1990 was $21,840; in Great Britain it was $15,053. Again using the GDP, purchasing power parity can be calculated and compared across countries. In 1990, with the GDP purchasing power index rate set at 100 for the U.S., Great Britain had a rate of 67. Thus, more goods and services could be purchased in the U.S. than the same dollar amount could purchased in Great Britain (Ruffin and Gregory, 1993). Americans, then, are "richer" than the British on the basis of purchasing power parity calculations.

Another measure which is used to compare economic welfare is a comparison of the distribution of wealth within each society. Income distribution may be a more accurate comparative indicator as it is a measure of overall social inequality, or who gets how much in a society (Smeeding et al., 1990). Table 4.4 compares family income distribution, in quintiles, for both the U.S. and Great Britain. The gini coefficient is a measure of the precise degree of income inequality within a country. As incomes become more equal, the coefficient approaches zero, and as they become more unequal, it approaches 1 (Spencer, 1990). At .37 in the U.S., and .343 in Great Britain, the distribution of wealth (income) in both countries was similar, but more equal in Great Britain.

Each country is considered to enjoy a relatively high standard of living internationally, which is often measured by percent of the total population who own major appliances (Statistical Abstracts of the U.S. 1987, 1987). Table 4.5 indicates a similar standard of living in the U.S. and Great Britain, as measured by appliance ownership.

In regard to international political philosophy and participation, the U.S. and Great Britain have long been among each other's strongest international allies (Dragnich and Rasmussen, 1986). Both are members of the United Nations, and permanent members of the Security Council. They are also allied by treaty in two powerful cooperative organizations, the North Atlantic Treaty Organization (NATO), which guarantees military assistance when requested,

Table 4.4: Percent Distribution of Family Net Income by Quintile, U.S. and Great Britain, 1985

	Quintile Shares (per cent) of Income	
	U.S.	Great Britain
Lowest Quintile	4.5	5.8
Second Quintile	11.2	11.5
Third Quintile	17.7	18.2
Fourth Quintile	25.6	25.0
Top Quintile	41.0	39.5
Gini coefficient	.370	.343

Note: Data from Smeeding, O'Higgins and Rainwater: Power Inequality and Income Distribution in Comparative Perspective: The Luxembourg Income Study.

Table 4.5: Percent of Population Owning Major Appliance, U.S. and Great Britain, 1985

	Appliance			
Country	Color Television	Clothes Washer	Electric Range	Electric Refrigeration
U.S.	88	82	60	93
Great Britain	88	73	57	86

Note: Data from Statistical Abstract of the U.S., 1987.

and the Organization for Economic Cooperation and Development (OECD) (Dragnich and Rasmussen, 1986; Information Please Almanac, Atlas, and Yearbook 1991, 1991).

The internal political organizations of the two nations, while different in several aspects, are similar in their overall character as strong democratic nations. In Great Britain, although the formal governmental structure retains an aristocratic House of Lords with nominal ceremonial powers, real decision making is by and through elected representatives of the people, as in the U.S. Both nations have a two-party system. The Conservatives in Great Britain have a political philosophy akin to the Republican party in the U.S., and the Labour party a philosophy akin to the Democratic party. In the U.S. and Great Britain, the supreme law of the land is vested in a Constitution, a body of laws which, in each nation, establishes the institutions of government, and the ways the political process functions (Dragnich and Rasmussen, 1986). In the U.S. the constitution is one written document which can be amended, while in Great Britain it is a series of written documents and unwritten tradition.

Each nation has a legislative branch as part of its governmental structure, where members of the legislative body are popularly elected (the House of Representatives and Senate in the U.S.; the House of Commons in Parliament in Great Britain). Bills and laws are originated, and treaties are ratified in both legislative bodies. Each nation has a chief executive who leads the nation (the President in the U.S., the Prime Minister in Great Britain), however, the selection process differs in each nation. In the U.S., the chief executive is popularly elected. In Great Britain, the chief executive is a member of the legislative body, the House of Commons, and is selected by the political party that has control of that House. Both chief executives select a Cabinet, whose members serve as advisors to, and assist the chief executive (Dragnich and Rasmussen, 1986).

The American judicial system operates on legal foundations very much like those in Great Britain, and follow similar procedures (Dragnich and Rasmussen, 1986). The judicial system in each country is independent of the other branches of government. They both operate under the British common law system, as opposed to the Roman Civil law system. The common law system is based on the principle of precedent; that previous cases decide present ones (Dragnich and Rasmussen, 1986).

While the political philosophy and dynamics are similar in the U.S. and Great Britain, the political culture is different. British citizens look to their government to solve their problems more than do citizens of the U.S., and believe that the government has a social obligation toward, and responsibility for, the welfare of the citizens. There is also a strong conviction that people should actively participate in their government, and the local governments in Great Britain are run by unpaid volunteers, as a part of service to their municipalities. The citizenry of Great Britain tend to be very well informed in matters of public policy and have high expectations of their political leaders (Dragnich and Rasmussen, 1986). Figure 4.1 illustrates the differences in the public's perception of the appropriate roles for government to undertake in both the U.S. and Great Britain. As can be seen, British citizens expect more from their government in both social and economic spheres than do citizens of the U.S., which is consistent with the presence of a National Health Service in Great Britain, but not in the U.S.

The two nations share many cultural elements. The racial origins of the British are nordic (northern European) and Mediterranean (southern Europe), which are also the two major groups of racial origin in the United States (Dragnich and Rasmussen, 1986). The British established permanent settlements in the United States in the 1600's, and Great Britain maintained sovereignty over the American colonies until their independence in 1776. Having gained political and economic power during the colonial period, descendants of the British settlers have managed to keep this power to a great extent, and their cultural values remain as the dominant ones in the United States today (Dragnich and Rasmussen, 1986).

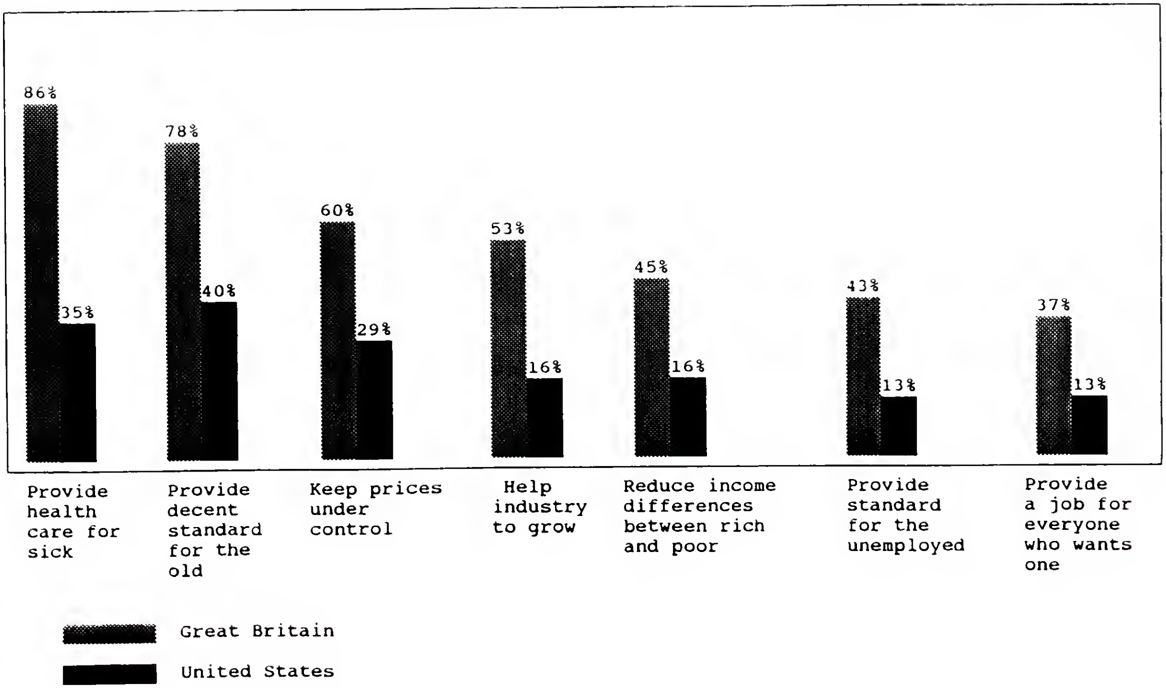

Figure 4.1: Anglo-American Differences about Government's Role

Note: Almond, G. A. and Powell, G. B., Comparative Politics Today: A World View (5th edition).

The English language is the dominant language in both countries, and Christianity the dominant religion. The British are overwhelmingly Protestant, and the Anglican Church is the largest single denomination. Baptists, Methodists, and Presbyterians are also well represented among the Protestant denominations. The second most populous religious group in Great Britain is Roman Catholic. In the U.S., where Christianity is also the dominant religion, most Americans are Protestant, but a large minority are Roman Catholic. The Baptists, Methodists, Lutherans, and Presbyterians are the major Protestant denominations in the U.S. (1985/86 Statistical Yearbook, 1988).

The 1985 reported literacy rate for both the U.S. and Great Britain was an identical 99% (The World Almanac and Book of Facts 1987, 1987). The percent of those from ages five to 24 years who attended school in Great Britain in 1985 was 63.9, and 70.6 in the U.S. The two nations reported almost exact same attendance for ages five to 16, but the U.S. reported higher school attendance rates than Great Britain for ages 17 to 24 (Demographic Yearbook 1988, 1990). Thus, Americans had higher rates of college attendance, and higher levels of educational completion than in Great Britain. Public expenditures for education in both nations were similar; in 1985 Great Britain spent 5.7% of its gross national product (GNP) for education, the U.S.

spent 6.0% (Information Please Almanac, Atlas, and Yearbook 1991, 1991). Each nation also has a free press protected by law, and a high circulation (The Europa World Yearbook 1989, 1989).

In summary, both the U.S. and Great Britain are class based stratified societies and major western industrialized nations. Each has a capitalist economic structure, a democratic form of government, and advanced systems of health care delivery. They have high rates of labor force participation in similar industries, and populations alike in age and gender distribution and with a similar income distribution and standard of living. The two nations share many of the same cultural elements, including the same language, major religions, and educational measures. The United States and Great Britain are similar on political, economic, and cultural dimensions, but differ in the form of their medical institution for delivery of health care. According to the logic of the maximizing similarities, these similar political, economic, and cultural features are eliminated as variables to explain any difference between the two countries in the SES-health status relationship which may be discovered within the two countries. The major feature on which the two societies differ, the health care system, was hypothesized to explain any difference discovered in this study in the SES-health status relationships within the two countries.

Data

When doing comparative research, the problem of comparable measurement appears at the systemic level (between social systems) and within-system level (within each social system) of analysis. Samples must be similar, and measurements used must be valid in terms of each social system and also reliable across social systems. The samples for both the British and U.S. studies were randomly selected nationwide samples, and used a multi-stage sampling design based upon geographically defined units. Both were considered representative of their respective populations.

Each data set represented the most complete data collection of medical information in each country. Both data sets were nationwide, current, and offered a wide array of questions about individuals, health behaviors, health conditions, and functional abilities. Each was weighted to assure that it was in fact representative of its respective population as a whole. Both instruments were developed at major universities in each country for their respective national health departments.

While in some cases, the questions asked and response categories offered in each data set were exactly the same, in other cases they were not. However, in cases where they were not, comparable categories could be developed. When engaging in comparative research, it is not necessary that questions or response categories be exactly alike, but that they are logically similar, and tap into, or are measures of, the same concepts (Przeworski and Teune, 1970). It is believed that, for each variable used in this research, either an exact comparison could be made between the two data sets, or a comparison that was logically similar and tapped into the same concept being measured was created.

Description of the Data Set - United States

The data for this study for the U.S. were taken from the Health Interview Survey, 1985, which was conducted by the Inter-university Consortium for Political and Social Research, Ann Arbor, Michigan. The principal funding agency was the United States Department of Health and Human Services, National Center for Health Statistics. This data set constituted a sample of the civilian, noninstitutionalized population of the U.S. from 1,900 geographically defined Primary Sampling Units (PSU). A reduced number of 198 PSU's were selected for the study sample. There are six parts or data files in the Health Interview Survey: Household, Person, Condition, Hospital Episodes, Doctor Visits, and Health Promotion and Disease Prevention Supplement. The total sample size of the Health Interview Survey was 91,531 respondents. Part Six, Health Promotion and Disease Prevention Supplement was chosen as the data set for this study, as it included the variables of interest on health behaviors and health status. This sample totaled

33,630 respondents. One person was selected from each household interviewed to be a self-respondent to the supplement's questions. Neither an original sample size nor a response rate was given for the Health Interview Survey or the Health Promotion and Disease Prevention Supplement. Data were weighted to assure that they were in fact representative of the population of the United States as a whole.

Description of the Data Set - Great Britain

The data for this study for Great Britain were taken from the Health and Lifestyle Survey 1984-1985, which was collected by the Office of the Regius Professor of Physic, Cambridge University School of Clinical Medicine, by B.D. Cox and research associates during the period of August 1984 to July 1985. This data set constitutes a sample of individuals age 18 and over living in private households in England, Wales, and Scotland. The study population was compared with data from the 1981 census and found to be comparable by age, gender, and regional distribution. The 12,254 addresses yielded interviews with 9,003 individuals, which were surveyed from a sample of 198 Parliamentary constituencies from within Standard Region population density bands. The final sample total of 9,003 yielded a response rate of 73.5%. One adult per household was selected to be the primary respondent.

The Health and Lifestyle Survey consisted of three sections. The first section was the Health and Lifestyle Interview, which included demographic, health status, and lifestyle behavior questions. The second section was the Measurement Performa - Part 1, which included questions about the residence, and health measurements taken by a nurse, including blood pressure, respiratory function, and response rates to tasks. The third section, the Behaviour Pattern Questionnaire, was a self-completion booklet which asked questions indicating levels of psychological well-being. Responses from the first section, the Health and Lifestyle Interview, comprised the data set used in this study.

Sample Characteristics

United States

Table 4.6 contains descriptive information about the sample utilized in this research. Information was based on a weighted sample, and missing values were assigned mean values for interval level variables, and median values for ordinal level variables. As can be seen from the table, 42% of the respondents were male, and 58% were female, while the overall population proportion was 49% male and 51% female. Eighty-two percent of the sample was white, 18% nonwhite. The mean age was 45. The mean family income of the respondent was in the range of $20,000 to $24,999 annually,

Table 4.6: Sample Characteristics, United States

Characteristic	Mean	Median	Percentage
Gender			
Male			42
Female			58
Race			
White			82
Nonwhite			18
Age	45		
Income		$22,499.50	
Education		12 years	
Employment			
Employed			60
Unemployed			4
Not in Labor Force			36
Location			
SMSA			75
Rural			25
Marital Status			
Married			55
Never Married			20
Widowed			12
Divorced			10
Separated			3

with the median of the range at $22,499.50. This value is only slightly lower than the 1985 national mean of $22,646, as reported in the Statistical Abstracts of the U.S. 1988 (1988). Sixty-four percent of the sample respondents had at least a high school education, 36% reported at least some college education, while almost none (only 153 respondents) reported no education. The median category was that of high school graduate. Sixty percent of the sample were employed, 4% were unemployed, and 36% were not in the labor force, including homemakers, students, and retired persons. Most of the sample (75%) were urban dwellers. Only 25% lived in rural areas. Finally, 55% of the sample were married, 20% were never married, 12% widowed, 10% divorced, and 3% separated.

Great Britain

Descriptive information about the British sample is shown in Table 4.7. Missing values were assigned mean values for interval level variables, and median values for ordinal level variables. Forty-eight percent of the sample respondents were male and 52% were female, similar to the sample distribution of 42% male and 58% female in the U.S. Ninety-seven percent of the respondents were classified as European, and 3% as non-European, including people from India, Pakistan, Bangladesh, Africa, the West Indies and other non-Europeans. The mean age of the sample was 46 years. The mean income of the sample fell within the range (in U.S. dollars) of $11,485 and $14,850 per year. The median income in this range was $13,167.50, and the mean income reported in the Annual Abstracts of Statistics, 1988 (1989) for Great Britain was $13,105.00. Fifty percent of the sample respondents reported that they had obtained no school-leaving qualifications, 27% reported the equivalent

Table 4.7: Sample Characteristics, Great Britain

Characteristic	Mean	Median	Percentage
Gender			
Male			48
Female			52
Race			
White			97
Nonwhite			3
Age	46		
Income		$13,167.50	
Education		6 years	
Employment			
Employed			68
Unemployed			9
Not in Labor Force			23
Marital Status			
Married			73
Never Married			19
Widowed			4
Divorced/Separated			4

of a U.S. high school degree, and 23% had some college education. The median category was elementary school graduate. Sixty-eight percent of the sample respondents were employed, 9% were unemployed, and 23% were either retired, students, or homemakers. Lastly, 73% of sample respondents were married, 19% were never married, 4% were widowed, and 4% were divorced or separated. Geographical location of respondents was not reported.

Variables of Interest

Dependent Variable

The dependent variable of interest in this study was health status (HEALTH), as measured by self-reported health status. Many studies (George and Landerman, 1984; Idler and Kasl, 1991; Kaplan and Camancho, 1983; Mossey and Shapiro, 1982; Okun et al., 1984; Roos et al., 1988; Segovia et al., 1989) have found self-assessed health status to be the best predictor of health outcomes, and consistent with independent physician assessment. In both data sets, an identical question was asked regarding health status: "Would you say that our health in general is..." The response choices in the British data set were in ordinal level categories "poor," "fair," "good," and "excellent." The same choices were given in the U.S. data set with the inclusion of "very good" as a possible response.

In the U.S. data set, the response choices were coded as follows: health as "poor" (00), "fair" (01), "good" (02), "very good" (03), and "excellent" (04). The missing values were set to the median response category "good" (02). Initial computer runs used these five categories. In subsequent runs, in order to make the two data sets as comparable as possible, "very good" (03) and "excellent" (04) were combined as one category (03). The median response category was still "good" (02).

In the British data set, the response choices were coded into four levels: health as "poor" (00), "fair" (01), "good" (02), and "excellent" (03). Missing values were set to the median category "good" (02).

Independent Variables

The independent variables used in this study were measures of: (1) socioeconomic status, (2) demographic variables, and (3) engagement in health behaviors.

Socioeconomic Status (INCOME)

Three indices are generally used to measure socioeconomic status: income, education, and occupation, either singly or in combination. In this study, income, an ordinal level variable, was used as the measure of SES. The literature has shown that financial barriers constitute the major impediment in access to health care in the U.S. today, as ability to pay determines services received and the quality of those services. While both data sets provide income information, British units are in pounds and U.S. units are in dollars. The 1985 rate of conversion (British pound x 1.65 = U.S. dollar) was used in order to convert pounds to dollars.

In the U.S. data set, family income level was an ordinal level variable, set in categories of $999 increments, beginning with "less than $1,000," coded as

(00); continuing with "$1,000-$1,999," coded as (01); "$2,000-$2,999" (02) through "$19,000-$19,999" (19). Income increments were then increased to $4,999 for incomes of $20,000 through $49,999, coded (20) through (25). All incomes over $50,000 were classified as "$50,000 and above," and coded (26). Initial computer runs included all 26 levels of income. In later runs, in order to make the income categories as similar as possible in both data sets, the income categories in the U.S. data set were recoded to twelve categories, corresponding as closely as possible to the British categories. They were recoded as follows: categories (00, 01 = 00), (02,03,04 = 01), (05,06 = 02), (07 = 03), (08,09,10 = 04), (11,12,13,14 = 05), (15 = 06), (16,17,18,19 = 07), (20 = 08), (21 = 09), (22,23 = 10), (24,25,26 = 11). Missing values were set to the median category (08).

In the British data set, family income level was also set in categories, thus was an ordinal level variable. Income was categorized in net pounds per month. The categories were converted to yearly amounts (monthly times twelve) and into U.S. dollars. The categories were coded as: "less than $2178" (00), "$2178-$4554" (01), "$4555-$6732" (02), "$6733-$8217" (03), "$8218-$11484" (04), "$11485-$14850" (05), $14851-$16434" (06), "$16434-$19701" (07), "$19702-$24750" (08), "$24751-$29700" (09),

"$29701-$41184" (10), and "$41185 and above" (11). The missing values were set to the median value category (05).

Demographic Variables

Education (EDUC)

As a measure of SES, some studies have found education to be a good predictor of health status (see, e.g., Williams, 1990). Therefore, it was controlled for in this study, in order to allow more accurate predictions of the effect of income on health status.

In the U.S. data set, education was measured in categories by highest level of education completed by the respondent, thus was an ordinal level variable. Response categories, as coded in the U.S. data set were: none, or kindergarten only (00), 1-8 years or elementary (01), 9-11 years of high school (02), 12 years or high school graduate (03), 1-3 years college (04), 4 years or college graduate (05), and 5+ years or post-college (06). The missing values were set to the median category "high school graduate" (03).

Education in the British data set was also measured as an ordinal level variable, by the highest level completed. As the British school system is categorized differently than the U.S., it was necessary to have the British levels converted into their American equivalents. This was accomplished with the assistance of an expert in the English educational system, Dr. Jeremy Curtoys (J. Curtoys, personal communication, December 10, 1992). The educational levels were coded as follows: no qualifications obtained (00), elementary school completion (01), some high school (02), high school graduate (03), 1-2 years of college (04), and college graduate (05). Missing values were set to the median category "no qualifications obtained" (00).

Age (AGEYR)

Age has also been found to be a significant correlate of health status, with older groups having poorer health than younger groups (Idler and Kasl, 1991). Therefore, it was controlled for in this study.

In the U.S. data set, the year of birth (AGE) was given for each respondent. The respondent's age (AGEYR) was then calculated by subtracting the birth year from 1985. This interval level variable ranged from 18 years (minimum age required to participate in the survey), to 107 years. There were 18 missing values, and they were set to the mean age of 45 years. In the initial computer runs respondents of all ages were included. In subsequent runs, respondents over the age of 65 were eliminated from the sample. Americans over the age of 65 are provided health insurance by the government (Medicare), so it was felt that their ability to purchase health care might make them dissimilar to the rest of the population, as they might not be as dependent on their personal income to purchase health care.

Age was also treated as an interval-level variable in the British data set. Respondents were asked their age in years, and ages ranged from 18 to 97. The mean reported age was 46 years. There were no missing values for this variable. There were no age groups eliminated from this sample as all British citizens, regardless of income, are provided health care by the government.

Health behaviors

Both the U.S. and British data sets contained information on engagement in the health promotion behaviors of interest, as identified by Belloc and Breslow (1972) and Berkman and Breslow (1983). They included cigarette smoking, alcohol consumption, exercise, weight, and hours of sleep. The diet habit, eating breakfast, a health behavior identified by Belloc and Breslow, was also included in the analysis.

Exercise (EXER) - the identical question, "Compared to others your age, are you more, less, or about as active?" appeared in both data sets, and was used as the measure of exercise for the respondents.

Ordinal-level response categories in the U.S. data set were coded as follows: "less active" (00), "about as active" (01), and "more active" (02). Missing values were coded to the median category (01).

Ordinal-level response categories in the British data set were coded as follows: "less active" (00), "about average" (01), and "more active" (02). Missing values were coded to the median category (01).

Cigarette smoking (SMOKE) - to measure smoking behavior, an identical question was asked in both the British and U.S. data sets: "How many cigarettes do you smoke per day," for those respondents who reported that they did smoke.

This interval level variable ranged from 0-98+ per day in the U.S. data set. The missing values were set to the mean of five cigarettes smoked per day.

This interval level variable ranged from 0-97+ per day in the British data set. Missing values were set to the mean of five cigarettes smoked per day.

Alcohol consumption (DRINK) - while not asking identical questions concerning drinking behavior, each data set asked for information from which an identical measure was created. The British data set asked if the respondent was a "non, light, moderate, or heavy drinker." The U.S. data set asked about "number of days drank in past two weeks", with a possible range from "none/never to 14, or every day", and also asked the "number of drinks per day" for those who responded that they had had a drink in the past two weeks. Respondents who answered "none/never" were combined with respondents who described themselves as "nondrinkers". The mean number of drinks per day was first calculated (2.5 drinks per day). Then the mean number of drinks per day (2.5) was multiplied by number of days drank in past two weeks. The missing values for this response were set to the mean of 2.5 drinks per day. Those who drank 1-3 days every two weeks, or 1-6 days per month were classified as light drinkers (2.5 drinks per day times 1-6 drinks per month, or 2.5 to 15 drinks per month). Berkman and Breslow (1983) defined light drinkers as less than 17 drinks per month. Those who drank from 3.5 to 8.5 drinks every two weeks (7-18 per month) were classified as moderate drinkers (17.5 - 45 drinks per month), as Berkman and Breslow (1983) defined moderate drinkers as those who drank 17 to 45 drinks per month. The heavy drinkers were those who were calculated to have had more than 45 drinks per month, again according to Berkman and Breslow's (1983) definition of heavy drinkers as having drunk 45 or more drinks per month. An ordinal level variable was thus created. Those who reported no drinking were coded (00), light drinkers were coded as (01), moderate as (02), and heavy drinkers as (03). Missing values were set to the median category (01).

The ordinal-level response categories in the British data set were coded as follows: non drinker (00), light drinker (01), moderate drinker (02), and heavy drinker (03). The missing values were set to the median category (01).

Diet (DIET) - members of both data sets were asked a question concerning how often breakfast was eaten by the respondent. While the response choices were not exactly alike, a similar scale was developed. This response was used as the measure of dietary habits.

Ordinal-level coded responses used in the U.S. data set were: "rarely/never" (00), "sometimes" (01), and "almost every day" (02). Missing values were set to the median category (01).

In the British data set, ordinal-level coded were: "never" (00), "once or twice a week" (01), "most every day" (02). The missing values were set to the median category (01).

Weight (WEIGHT) - members of both data sets were asked if they considered themselves "overweight (U.S.) or "too heavy" (Britain), "underweight" (U.S.) or "too light" Britain), or "just about the right weight," and was used as the measure for weight.

In the U.S. data set, ordinal-level coded responses used were: "underweight" (00), "about the right weight" (01), and "overweight" (02). Missing values were set to the median category (01).

In the British data set, ordinal-level coded responses used were: "too light" (00), "about the right weight" (01), and "too heavy" (02). Missing values were set to the median category (01).

Sleep (SLEEP) - members of the U.S. and British data set were each asked the identical question, "About how many hours of sleep do you get?" Berkman and Breslow (1983) found the highest mortality rate for those who slept less than six hours per night.

As the responses in the British data set were already coded into ordinal-level categories, the same categories were created from the U.S. data set, in order to be as similar and comparable as possible. They were: 0-5 hours (00), 6 hours (01), 7 hours (02), 8 hours (03), 9 hours (04), 10 hours (05), and 11-24 hours (06). For the U.S. data set, missing values were set to the median category of 7 hours (02), and for the British data set were set to the median category, also 7 hours (02).

Data Analysis

The literature review and the theoretical framework of this study suggested the following three analytical models to test the hypothesis that the relationship between SES and health status is stronger in a country without an NHS than in a country with an NHS. The data sets were analyzed separately and then compared in order to test the hypothesis.

Model One - the effect of SES on health status:

HEALTH = INCOME

Model Two - the effect of SES on health status, controlling for level of education, age, and health behaviors:

HEALTH = INCOME + EDUC + AGEYR + EXER + SMOKE + DRINK + WEIGHT + DIET + SLEEP

Model Three - inclusion of the interaction effects of INCOME and health behaviors:

HEALTH = INCOME + EDUC + AGEYR + EXER + SMOKE + DRINK + WEIGHT + DIET + SLEEP + INCOME*EXER + INCOME*SMOKE + INCOME*DRINK + INCOME*WEIGHT + INCOME*DIET + INCOME*SLEEP

The data for this study were analyzed by use of the SPSS-X program, version 3.0. The measure of the dependent variable (HEALTH) was ordinal in scale, and the independent variables were of ordinal (INCOME, SLEEP, DRINK, EXER, WEIGHT, DIET, INCOME, and EDUC) and interval levels (AGE, SMOKE). When the dependent variable is ordinal in scale, of four or more levels, Demaris (1992) states that it is safe to use OLS regression instead of ordered logit regression. When the independent variables are of both ordinal and interval levels, OLS regression is preferred (Anderson, 1972; Boneau, 1972; Demaris, 1992; Gaito, 1972). Use of this statistical method treats the scores of the ordinal level variables more like interval level variables than as nominal variables, which would occur with the use of logit analysis.

In this study, when:

INCOME = B_1X_1

EDUC = B_2X_2

AGEYR = B_3X_3

EXER = B_4X_4

SMOKE = B_5X_5

DRINK = B_6X_6

WEIGHT = B_7X_7

DIET = B_8X_8

SLEEP = B_9X_9

The regression models are:

Model One - $Y = \alpha + B_1X_1$

Model Two - $Y = \alpha + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + B_6X_6 + B_7X_7 + B_8X_8 + B_9X_9$

Model Three - $Y = \alpha + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + B_6X_6 + B_7X_7 + B_8X_8 + B_9X_9 + B_1X_1*B_4X_4 + B_1X_1*B_5X_5 + B_1X_1*B_6X_6 + B_1X_1*B_7X_7 + B_1X_1*B_8X_8 + B_1X_1*B_9X_9$

In the first stage of data analysis, correlations were determined among the variables of interest in the U.S. data set, and then in the British data set. The results of the correlation analyses within the two countries were then compared. The correlation analyses were useful in determining how some of the variables would be measured when included in the regression analyses, i.e., four versus five levels of the dependent variable.

In this first stage of data analysis it was also necessary to test for multicollinearity between some of the independent variables. As suggested by Agresti and Finlay (1986), the following were examined, when necessary, to determine if there was multicollinearity between two variables: (1) the estimated regression coefficients would tend to have large standard errors; (2) the R^2 between Y and a set of independent variables would be highly significant, but individually each partial regression coefficient would not be significant; and (3) the partial regression coefficient of one variable in the model would change significantly when the other variable was introduced.

In the second stage of data analysis, regression analyses were run on the three models introduced in Chapter 4. The goals of multiple regression analysis are to: (1) develop an equation or model that summarizes the relationship between a dependent variable and a set of independent variables, (2) identify that subset of independent variables that are most useful in predicting a dependent variable, and (3) predict values for the dependent variable from the values of the independent variables.

In order to build as concise models as possible, ones that would make good prediction possible, the independent variables were entered into models II and III through use of the stepwise selection process, as discussed in Agresti and Finlay (1986). As models from the U.S. and Great Britain were to be compared in this study, the goal was to create models that would be as parsimonious as possible, and would facilitate ease of interpretation. It was decided that the stepwise selection process was the best to use in order to meet this goal, as irrelevant variables were eliminated from the models. In the stepwise selection process the first variable considered for entry into the equation was the one which had the largest partial correlation (positive or negative) with the dependent variable. The variable was entered into the model if the probability associated with the F-test was less than or equal to .01 ($p<.01$). Since the sample size was so large, and small differences may have appeared statistically significant while having little substantive effect (Agresti and Finlay, 1986), the significance level was set at $p<.01$. The second variable was then entered into the model based on the next highest partial correlation with the dependent variable. At the same time the second variable was entered, the first variable was again examined to see if it should now be removed according to the above criteria ($p<.01$). At each step of entry of another variable into the model the variables already in the model were again examined for possible removal. Thus, the resulting models were the most concise possible that would make good prediction possible.

In order to determine within-country relationships, the results of the regression analyses were analyzed separately for each country. Then, in order to determine the degree to which discovered relationships between variables were similar or different across the societies, a comparison was made of these separate results. In this way, the hypothesized relationship between health status and SES was tested. The test of the hypothesis suggested the effect that the system of health care delivery had on the health status of the members of each society, and if the institution of a system of health care delivery similar to that of Great Britain might be warranted in the U.S. In the second stage of data analysis, regression analyses were first performed using the variables of interest from the U.S. data set, then from the British data set. Results were then compared.

When building the models from the data, it was necessary to estimate how well the models fit the sample, or to summarize the relationship between the dependent variable and the set of independent variables. For the first model (HEALTH = INCOME), it was necessary to determine if there was a linear relationship between health status and income. The coefficient of determination (R^2) is a commonly used measure of the goodness-of-fit of a model for the sample (Agresti and Finlay, 1986). However, while it may fit the sample well, the coefficient of determination may not fit the population as well. Agresti and Finlay (1986) suggest that the adjusted R^2 be used, as this statistic corrects the R^2 to better reflect the goodness-of-fit of the model for the population. In this study, the adjusted R^2 was used in the analysis of the data.

For this first model, if the R^2 statistic were to equal one ($R^2 = 1$), then all of the sample observations would lie on the regression line. Therefore, the test of the null hypothesis, $R^2 = 0$, would be the test that there was no linear relationship between health status and level of income. In this study, the F-test was used to determine how well this first regression model fit the data. The coefficient of determination was also used to see what proportion of the variance in the dependent variable was explained by the model.

We also wanted to predict values for the dependent variable from the values of the independent variables so we could see how much change in levels of health status there would be based on change in level of income. In order to predict values of the dependent variable from the values of the independent variable, the Beta (standardized) coefficient was used rather than the b (unstandardized) coefficient. The actual magnitude of the coefficient depends on the units in which the variables are measured. Only if the variables are measured in the same units are the coefficients directly comparable. In this model, income and health status were measured in different units, thus, the Beta weights were used. The independent variables were all measured in different units, i.e., age in years, income in dollars, sleep in hours. In order to make the coefficients more comparable, the Beta weights were used in all models, where the coefficients of all variables were expressed in a standardized form (Z-score form) rather than in the disparate units of measurement.

In order to estimate how well the second model (HEALTH = INCOME + EDUC + AGEYR + EXER + SMOKE + DRINK + WEIGHT + DIET + SLEEP) in each data set fit the sample, the null hypothesis that there was no linear relationship between health status and the subset of the nine independent variables was tested by use of the F-test: $B_1=B_2=B_3=B_4B_5=B_6=B_7=B_8=B_9=0$. For the third model in the data set (HEALTH = INCOME + EDUC + AGEYR + EXER + SMOKE + DRINK + WEIGHT + DIET + SLEEP + INC*EXER + INC*SMOKE + INC*DRINK + INC*WEIGHT + INC*DIET + INC*SLEEP) the same procedure was employed. The null hypothesis that there was no linear relationship between health status and the entire subset of the 15 independent variables was tested by use of the F-test: $B_1=B_2=B_3=B_4=B_5=B_6=B_7=B_8=B_9=B_{10}=B_{11}=B_{12}=B_{13}=B_{14}=B_{15}=0$. If the probabilities associated with the F-tests were small, then the null hypotheses of no linear relationships between the variables could be rejected.

The analysis of the three models developed tested the hypothesis of this study concerning the relationship between health status and socioeconomic status both within and between the U.S. and Great Britain. The analysis also determined which variables most significantly affected levels of health status in both countries. Examination of the analysis helped to determine if the institution of an NHS in the U.S. would be warranted.

CHAPTER 5
FINDINGS AND DISCUSSION

In this chapter, findings of the correlations run between all variables, and the regression analyses performed on the three models presented in Chapter 4 are presented. The effects of theoretically defined variables upon health status were tested, including income level, educational level, age, and health promotion behaviors. The three models were tested separately for the United States and Great Britain and the results were then compared. This method allowed for examination of within-country relationships, where observations were made on units within the societies, and then on the degree to which the relationships between variables were similar or different across the societies, or on a structural level. The structural-level variable, system of health care delivery, was proposed as a variable which affects the health status of the members of each society.

Correlation Analysis - United States

The data from the U.S. were first analyzed with the inclusion of all respondents in the sample, resulting in a sample size of 33,630. Five levels of health status (poor, fair, good, very good, excellent) and 26 levels of income were used. The results of this correlation analysis can be seen in Table 5.1. The dependent variable, health status, was most strongly correlated with educational level (.3502), then age of respondent (-.3369), income level (.2549), and level of participation in exercise (.2300). Most of the correlations between health status and the independent variables were significant at p<.001; the only correlation that was not significant at this level was that between smoking and income (.0001, significant at p<.490). In addition, the correlation between income level and educational level was high (.3619), suggesting the possibility of multicollinearity among these two variables.

A regression analysis was run including the variables measuring income, education, and health status in order to test for multicollinearity. In response to the first test suggested by Agresti and Finlay (1986), the estimated regression coefficients of both income and education had small standard errors: The standard error for income was 8.4614E-04, and for education was .004. For the second test, the R^2 (.14) between health status and the set of independent variables, income and education, was significant (p<.001), as were each of the partial regression coefficients (p<.001) for both income and education). Finally, in response to the third test, the partial regression coefficient of the variable income did not change

Table 5-1: Correlations, All Variables, United States
(n=33,630) Income = 26 levels; Health Status = 5 levels

	HEALTH	INCOME	EDUC	AGEYR	EXER	SMOKE	DRINK	WEIGHT	DIET	SLEEP
HEALTH	1.000									
INCOME	.2549***	1.000								
EDUC	.3501***	.3619***	1.000							
AGEYR	-.3369***	-.1031***	-.2912***	1.000						
EXER	.2300***	.0692***	.0748***	.0767***	1.000					
SMOKE	-.0553***	.0001	-.0785***	-.0868***	-.0708	1.000				
DRINK	.1859***	.1766***	.2294***	-.1531***	.0689***	.1751***	1.000			
WEIGHT	-.0220***	.0895***	.0395***	.0251***	-.1086***	-.0630***	-.0509***	1.000		
DIET	-.0584***	-.0200***	-.0179***	.3010***	.0693***	-.2352***	-.1251***	-.0432***	1.000	
SLEEP	-.0632***	.0923***	-.1007***	.0463***	-.0435***	-.0349***	-.0505***	-.0523***	.0619***	1.000

*P≤.05 **p≤.01 ***p≤.001

significantly when the variable education was introduced into the model. The partial regression coefficient when income alone was in the model was .039, when education was added it changed to .023. Therefore, it was concluded that the variables income and education had an independent effect on health status.

The second set of correlations was run using four levels of health status for the U.S. (poor, fair, good, excellent), where "very good" and "excellent" were combined to be more comparable to the British levels. Twenty-six levels of income were used, and all respondents were included (n=33,630). As seen in Table 5.2, the strongest correlations (p<.001) with health status were again educational level (.3336), age (-.3369), income (.2549), and exercise (.2268). The only correlation not significant at the .001 level was that between smoking and income (.0001, p<.490), just as in the correlations run with five levels of health status. As would be expected, combining levels of the dependent variable produced similar results for correlations among all variables.

A third set of correlations was run excluding those aged 65 and over. This reduced the sample size to 26,996. The original five levels of health status (poor, fair, good, very good, excellent) were used, as were 26 levels of income. Those aged 65 and over were excluded in this analysis because of the availability of health care

Table 5-2: Correlations, All Variables, United States
(n=33,630) Income = 26 levels; Health Status = 4 levels

	HEALTH	INCOME	EDUC	AGEYR	EXER	SMOKE	DRINK	WEIGHT	DIET	SLEEP
HEALTH	1.000									
INCOME	.2523***	1.000								
EDUC	.3336***	.3619***	1.000							
AGEYR	-.3331***	-.1031***	-.2912***	1.000						
EXER	.2268***	.0692***	.0748***	.0767***	1.000					
SMOKE	-.0436***	.0001	-.0785***	-.0868***	-.0708	1.000				
DRINK	.1820***	.1766***	.2294***	-.1531***	.0689***	.1751***	1.000			
WEIGHT	-.0033***	.0895***	.0395***	.0251***	-.1086***	-.0630***	-.0509***	1.000		
DIET	-.0603***	-.0200***	-.0179***	.3010***	.0693***	-.2352***	-.1251***	-.0432***	1.000	
SLEEP	-.0652***	.0923***	-.1007***	.0463***	-.0435***	-.0349***	-.0505***	-.0523***	.0619***	1.000

*P≤.05 **p≤.01 ***p≤.001

assistance in the form of Medicare to those over 65; thus it was felt that this group might have been dissimilar to the majority of Americans who are under age 65 and who may or may not have health care assistance. The quantity and quality of the medical care received by Americans 65 and older might not have been as dependent on their economic status as it might have been for those under 65 who did not have Medicare coverage.

The results of this correlation matrix are shown in Table 5.3. As with the other correlation matrices, the variables most strongly correlated with health status were educational level (.3200), age (-.2586), level of participation in exercise (.2287), and income (.2199). Interestingly, the correlation between health status and income was slightly weaker in this matrix, which excluded those over 65, than in the matrices which included those aged 65 and over. The fact that the correlation between health status and income was stronger in the group which included those over 65 suggested that even though most members of this group have Medicare coverage, that coverage has not reduced the significance of income in affecting health status. Correlations between variables were all significant at $p<.001$ except for the correlations between diet and health status (.0068, $p<.132$), and weight and educational level (.0109, $p<.036$).

Table 5-3: Correlations, All Variables, United States
(n=26,996) Income = 26 levels; Health Status = 5 levels

	HEALTH	INCOME	EDUC	AGEYR	EXER	SMOKE	DRINK	WEIGHT	DIET	SLEEP
HEALTH	1.000									
INCOME	.2199***	1.000								
EDUC	.3200***	.3073***	1.000							
AGEYR	-.2586***	-.1438***	-.1200***	1.000						
EXER	.2287***	.0826***	.0928***	.0351***	1.000					
SMOKE	-.1095***	-.0380	-.1510***	-.0432***	-.0606	1.000				
DRINK	.1492***	.1220***	.1834***	-.0415***	.0866***	.1610***	1.000			
WEIGHT	-.0569***	.0805***	.0109*	.1529***	-.1294***	-.0722***	-.0787***	1.000		
DIET	.0068	.0409***	.0656***	.1578***	.0584***	-.2138***	-.0949***	-.0293***	1.000	
SLEEP	-.0481***	-.0970***	-.0950***	-.0309***	-.0512***	-.0378***	-.0502***	-.0468***	.0513***	1.000

*P≤.05 **p≤.01 ***p≤.001

A fourth correlation matrix (Table 5.4) was run with the combined four levels of health status, excluding those respondents 65 years and over, and 26 levels of income. Educational level (.3068), age (-.2665), income level (.2211), and participation in exercise (.2217) again showed the strongest correlations with health status. All variables, except diet and health status (.0017, p<.388) and weight and educational level (.0109, p<.036) were significant at p<.001.

A comparison of the four correlation matrices showed that they were similar regardless of levels of health status used, or whether groups 65 years of age and over were included or excluded. The correlations between variables were similar in both direction and in absolute size of the correlation. In regard to the correlations in which health status was one of the variables, the strongest correlation in all four matrices was that between health status and level of education, and all were significant at p<.001.

There were some noteworthy group differences in the matrices where respondents 65 years and older were either included or excluded in the analysis. In both correlation matrices which included respondents aged 65 and over (Tables 5.1 and 5.2), there was a negative correlation of .33 between health status and age. In the matrices where the group over 65 was excluded (Tables 5.3 and 5.4), the negative correlation decreased to .26. When the over 65

Table 5-4: Correlations, All Variables, United States
(n=26,996) Income = 26 levels; Health Status = 4 levels

	HEALTH	INCOME	EDUC	AGEYR	EXER	SMOKE	DRINK	WEIGHT	DIET	SLEEP
HEALTH	1.000									
INCOME	.2211***	1.000								
EDUC	.3068***	.3073***	1.000							
AGEYR	-.2665***	-.1438***	-.1200***	1.000						
EXER	.2217***	.0826***	.0928***	.0351***	1.000					
SMOKE	-.0937***	-.0380	-.1510***	-.0432***	-.0606	1.000				
DRINK	.1466***	.1220***	.1834***	-.0415***	.0866***	.1610***	1.000			
WEIGHT	-.0384***	.0805***	.0109*	.1529***	-.1294***	-.0722***	-.0787***	1.000		
DIET	-.0017	.0409***	.0656***	.1578***	.0584***	-.2138***	-.0949***	-.0293***	1.000	
SLEEP	-.0507***	-.0970***	-.0950***	-.0309***	-.0512***	-.0378***	-.0502***	-.0468***	.0513***	1.000

*P≤.05 **p≤.01 ***p≤.001

group was included, the negative correlation between health status and age was of a greater magnitude, indicating that, as would be expected, reported health status decreased more rapidly when respondents aged 65 and older were included.

Another interesting finding between the two groups was the correlation between age and income. For the groups which included respondents 65 years and older, there was a significant, negative correlation between age and income (-.1031). For the groups which excluded those 65 and over, the correlation between age and income was significant and positive (.1438). In this sample, age and income were positively correlated when those respondents age 65 and over were not included in the analysis. When they were included, the direction of the correlation reversed. This may be due to the fact that at age 65, which is the usual age of retirement, income decreases with the loss of employment. In addition, the correlations between health status and income differed by age group membership. For groups including those 65 and over, the correlation was .25, for those groups excluding those 65 and over, the correlation was .22. Even though most Americans age 65 and over have Medicare coverage, there was still a stronger correlation between reported health status and income for those groups than for those under 65 years of age.

In three of the four matrices (Tables 5.1 and 5.2, where those 65 and older were included, and Table 5.4 where they were not included) the strongest correlations between all variables were between educational level and income, .36, .36, and .31 respectively. In the fourth matrix, Table 5.3, where those over 65 were not included, the strongest correlation was between health status and educational level (.32), and the second strongest correlation was that between educational level and income, .31. As for group differences, even though the correlation between educational level and income was not the strongest for each of the two groups excluding those 65 and over (Tables 5.3 and 5.4, where the correlation was strongest for Table 5.4, but second strongest for Table 5.3), the absolute size and direction of the correlation was the same, .31. The correlation between educational level and income was stronger for groups including those over 65 (.36), than for the groups excluding those respondents (.31).

As stated, for all groups, the strongest correlations with health status were with level of education. The second strongest correlations for all groups were between health status and age. The third and fourth strongest correlations differed for those groups which included and excluded respondents 65 and over. For groups with respondents 65 and over, the third strongest correlation was between health status and income (.25), and the fourth was between health status and exercise (.23). The results were just the opposite for groups which excluded those 65 and over. The third strongest correlation was health status and exercise (.23, the same size as for those over 65), but the fourth was health status and income (.22), weaker than for groups with those over 65). This suggested that both exercise and income level were significant correlates of reported health status in addition to level of education and age. It may be that exercise was a stronger correlate than was income in the group excluding those 65 and over because those under age 65 would be most likely to participate in exercise activity simply because they are younger and generally more physically able to do so.

Interestingly, drinking was positively correlated with exercise, health status, income, and educational level for all groups. However, in this sample, 37.5% of the respondents reported that they did not drink at all, and 39.1% reported that they were light drinkers (less than 17 drinks per month). It may be that this positive correlation was reflective of the change from no drinking to light drinking, rather than to high levels, or heavy drinking behavior (more than 45 drinks per month).

It was noted that smoking was consistently negatively correlated with health status and level of education. This suggested a negative consequence of smoking on perceived health status, and that those with a low educational level tend to smoke more. Therefore, those respondents who reported a low educational level may not only have a correspondingly low health status due to their lack of education, but also because they smoke more than those with higher levels of education.

Regardless of whether those respondents aged 65 and over were included or excluded, and regardless of whether the levels of the dependent variable used were four or five, the correlation matrices were very similar. It can be concluded that the variables most highly correlated with health status for Americans were, for all groups, educational level, age, level of income, and the lifestyle behavior of level of participation in exercise. In all matrices, the correlation between health status and educational level was strongest. It was expected that level of education, age, and income level would be strong correlates of health status, but the strength of the correlations between health status and exercise were somewhat surprising.

The same four correlation matrices were then run with the income variable reduced from 26 to 11 levels. The 11 levels were created to be comparable to the 11 income levels into which the income variable in the British data set had been coded by the original researchers who collected the data. The next four sets of correlation matrices were run to determine if there would be substantial differences in the correlations among variables if the income category was reduced. Table 5.5 is the display of the correlation matrix

Table 5-5: Correlations, All Variables, United States (n=33,630) Income = 11 levels; Health Status = 5 levels

	HEALTH	INCOME	EDUC	AGEYR	EXER	SMOKE	DRINK	WEIGHT	DIET	SLEEP
HEALTH	1.000									
INCOME	.2705***	1.000								
EDUC	.3502***	.3844***	1.000							
AGEYR	-.3369***	-.1455***	-.2912***	1.000						
EXER	.2300***	.0592***	.0748***	.0767***	1.000					
SMOKE	-.0553***	.0094*	-.0785***	-.0868***	-.0708***	1.000				
DRINK	.1859***	.1971***	.2294***	-.1531***	.0689***	.1751***	1.000			
WEIGHT	-.0220***	.0914***	.0395*	.0251***	-.1086***	-.0630***	-.0509***	1.000		
DIET	-.0584	-.0370***	-.0179***	.3010***	.0693***	-.2352***	-.1251***	-.0432***	1.000	
SLEEP	-.0632***	-.0927***	-.1007***	.0463***	-.0435***	-.0349***	-.0505***	-.0523***	.0619***	1.000

*P≤.05 **p≤.01 ***p≤.001

where respondents aged 65 and older were included, and levels of health status were five, but with 11 rather than 26 levels of the income variable. It would not be expected that there would be significant changes in the correlations among variables with the reduction in number of levels of income, and none were found.

The same results were found in the three other correlation matrices run with 11 levels of income rather than 26 levels. Table 5.6 is the correlation matrix where respondents aged 65 and over were included, there were four levels of health status, and 11 levels of income. In Table 5.7, the correlation matrix excluded respondents 65 and over, five levels of health status were included, and 11 levels of income were used. The final correlation matrix is displayed in Table. 5.8, where respondents aged 65 and over were excluded, levels of health status were four, and levels of income were 11.

Correlations with income levels of 26 and 11 varied slightly, but not enough to conclude that a reduction in levels of income from 26 to 11 would significantly affect any explanatory power of income in future analyses. It was decided that 11 levels of income would be used in future analyses, making the data from the U.S. comparable to the data from Great Britain. Since the correlation analyses did show that income was more highly correlated with health status for those groups which included respondents aged 65

Table 5-6: Correlations, All Variables, United States
(n=33,630) Income = 11 levels; Health Status = 4 levels

	HEALTH	INCOME	EDUC	AGEYR	EXER	SMOKE	DRINK	WEIGHT	DIET	SLEEP
HEALTH	1.000									
INCOME	.2662***	1.000								
EDUC	.3366***	.3844***	1.000							
AGEYR	-.3331***	-.1455***	-.2912***	1.000						
EXER	.2268***	.0592***	.0748***	.0767***	1.000					
SMOKE	-.0436***	.0094*	-.0785***	-.0868***	-.0708***	1.000				
DRINK	.1820***	.1971***	.2294***	-.1531***	.0689***	.1751***	1.000			
WEIGHT	-.0033	.0914***	.0395***	.0251***	-.1086***	-.0630***	-.0509***	1.000		
DIET	-.0603	-.0370***	-.0179***	.3010***	.0693***	-.2352***	-.1251***	-.0432***	1.000	
SLEEP	-.0652***	.0927***	-.1007***	.0463***	-.0435***	-.0349***	-.0505***	-.0523***	.0619***	1.000

*P≤.05 **p≤.01 ***p≤.001

Table 5-7: Correlations, All Variables, United States
(n=26,996) Income = 11 levels; Health Status = 5 levels

	HEALTH	INCOME	EDUC	AGEYR	EXER	SMOKE	DRINK	WEIGHT	DIET	SLEEP
HEALTH	1.000									
INCOME	.2266***	1.000								
EDUC	.3200***	.3222***	1.000							
AGEYR	-.2586***	-.1110***	-.1200***	1.000						
EXER	.2287***	.0731***	.0928***	.0351***	1.000					
SMOKE	-.1095***	-.0333***	-.1510***	-.0432***	-.0606***	1.000				
DRINK	.1492***	.1356***	.1834***	-.0415***	.0866***	.1610***	1.000			
WEIGHT	-.0569	.0771***	.0190*	.1529***	-.1294***	-.0722***	-.0787***	1.000		
DIET	-.0068	-.0296***	-.0656***	.1578***	.0584***	-.2138***	-.0949***	-.0293***	1.000	
SLEEP	-.0481***	.0965***	-.0950***	-.0309***	-.0512***	-.0378***	-.0502***	-.0468***	.0513***	1.000

*P≤.05 **p≤.01 ***p≤.001

Table 5-8: Correlations, All Variables, United States
(n=26,996) Income = 11 levels; Health Status = 4 levels

	HEALTH	INCOME	EDUC	AGEYR	EXER	SMOKE	DRINK	WEIGHT	DIET	SLEEP
HEALTH	1.000									
INCOME	.2274***	1.000								
EDUC	.3068***	.3222***	1.000							
AGEYR	-.2665***	.1100***	-.1200***	1.000						
EXER	.2217***	.0731***	.0928***	.0351***	1.000					
SMOKE	-.0967***	-.0333***	-.1510***	-.0432***	-.0606***	1.000				
DRINK	.1466***	.1356***	.1834***	-.0415***	.0866***	.1610***	1.000			
WEIGHT	-.0384***	.0771***	.0190*	.1529***	-.1294***	-.0722***	-.0787***	1.000		
DIET	-.0017	.0296***	.0656***	.1578***	.0584***	-.2138***	-.0949***	-.0293***	1.000	
SLEEP	-.0507***	-.0965***	-.0950***	-.0309***	-.0512***	-.0378***	-.0502***	-.0468***	.0513***	1.000

*P≤.05 **p≤.01 ***p≤.001

and over than for those where they were excluded, it was decided that future analyses would use U.S. data which included respondents aged 65 and over. Since there were no differences in the correlation analyses based on level of health status, it was decided that four levels would be used in future analyses, making the U.S. and British data more comparable. Therefore, it was decided to use data from the United States which would be most comparable to the British data: four levels of the dependent variable, health status, 11 levels of income, and inclusion of respondents aged 65 and above (Table 5.6). It appeared that, regardless of the fact that most Americans over the age of 65 had Medicare coverage, income was still an important correlate of reported health status for this group, and that their health status was more negatively affected by decreased income levels than were those under 65, who did not have Medicare coverage.

Correlation Analysis - Great Britain

The results of the correlation analysis for all variables for the data from Great Britain are shown in Table 5.9. Interestingly, in this sample the strongest correlation among all variables was that between health status and level of participation in exercise (.3502), significant at $p<.001$. This suggested that, in this sample, high levels of participation in exercise were associated

Table 5-9: Correlations, All Variables, Great Britain
(n= 9,003) Income = 11 levels; Health Status = 4 levels

	HEALTH	INCOME	EDUC	AGEYR	EXER	SMOKE	DRINK	WEIGHT	DIET	SLEEP
HEALTH	1.000									
INCOME	.1639***	1.000								
EDUC	.1549***	.3396***	1.000							
AGEYR	-.0642***	.2891***	-.3461***	1.000						
EXER	.3502***	.0849***	.0560***	.0388***	1.000					
SMOKE	-.1379***	-.0530***	-.1010***	-.0935***	-.0536***	1.000				
DRINK	.0487***	.1888***	.1424***	-.2726***	.0303***	.1665***	1.000			
WEIGHT	-.0343***	.0262**	-.0494***	.0412***	-.0909***	-.0630***	-.0026	1.000		
DIET	.0347***	.0005	-.0200*	.0233**	.0423***	.0090	.0668***	-.0338***	1.000	
SLEEP	.0378***	.0049	.0129	-.1245***	-.0176*	-.0482***	.0030	-.0439***	.0301**	1.000

*P≤.05 **p≤.01 ***p≤.001

with high levels of reported health status. Correlations between educational level and level of income (.3396), age and income level (-.2891), and age and level of education (-.3461) were also strong ($p<.001$).

The correlation between level of education and level of income was strong, (.3396), again suggesting the possibility of multicollinearity between these two variables. The three criteria suggested by Agresti and Finlay (1986) were again used to test for multicollinearity between income and education and the results were as follows: For the first test, the estimated regression coefficients for levels of income and education in the model including health status, and levels of education and income, did not have large standard errors. The standard error of the regression coefficient for income was .004, and for education it was .006. In the second test, there was a highly significant R^2 between the dependent variable, health status, and the set of independent variables ($p<.001$), and each regression coefficient was also significant ($p<.001$) for both level of education and level of income. Finally, for the third test, the partial regression coefficient of income in the regression model (HEALTH = INCOME) was .05; when the variable education was added to the model there was not a substantial change in the regression coefficient for income (.04). Therefore, it was concluded that there was no evidence of multicollinearity between the variables income level and educational level, and each had an independent effect on health status.

Correlations between the dependent variable, health status, and independent variables were strongest for level of exercise (.3502), level of education (.1549), smoking (-.1379), and income (.1639), all significant at p<.001. Significant correlations between health status and smoking and educational level were expected, but the strong correlation between health status and exercise was surprising, as was the correlation between health status and income level. It was not expected that, in a country with an NHS, income would be so significantly correlated with health status. The expectation was that the presence of an NHS would produce a non-significant, or weak correlation. However, it was noteworthy that the negative correlation between age and health status was only -.0642, significant at p<.01, while at the same time, the negative correlation between age and income was considerably stronger (-.2891, p<.001). In this sample, income decreased as age increased, but health status decreased only minimally as age increased. This suggested that the presence of an NHS may have exerted a protective effect against decreasing health status as age increased. That is, having lived in a society under a system of health care that offered universal access to that system throughout one's lifetime may have decreased the negative impact of age on health status.

Comparison of the Correlation Analyses

There were some noteworthy differences in the correlations between the dependent variable, health status, and independent variables between the two countries. First, the correlation between health status and income was stronger in the U.S. (.2662) than was the correlation between income and health status in Great Britain (.1639). This indicated that, as hypothesized, level of income in the U.S. was more strongly associated with reported health status than it was in Great Britain.

Second, the correlation between health status and level of education was quite a bit stronger in the U.S. (.3336) than was the corresponding correlation in Great Britain (.1549). This indicated that higher educational levels in the U.S. were more strongly associated with higher levels of reported health status than in Great Britain. However, the weaker positive correlation found in Great Britain may be due to the fact that, in this sample, 49.7% of respondents in Great Britain reported the lowest level of educational achievement.

A large difference was noted between the strengths of the correlations between health status and age between the two countries. In the U.S., the correlation between health status and age was -.3331, while in Great Britain the correlation was -.0642. It was also noted that the negative correlation between age and income was stronger in Great

Britain (-.2891) than in the U.S. (-.1455). While income decreased with age in both countries, the decrease was greater in Great Britain. However, the decrease in health status with age in Great Britain was much weaker than in the U.S. In the U.S., as the age of respondents increased, income decreased less strongly, but health status decreased more strongly than in Great Britain. The British respondents seemed to have an income level which decreased significantly with age, more so than did income in the U.S., yet their health status decreased very little, less than in the U.S. An explanation might be that since there is a NHS in Great Britain, and elderly respondents do not have to pay for health care, their health status was not as vulnerable to decreased income levels as they aged as were the elderly American respondents. Even though most elderly Americans had Medicare coverage, it was shown earlier that there was a stronger correlation between reported health status and income level for those groups which included respondents over 65 than those groups which excluded respondents over 65.

While surprisingly strong in both countries, the correlation between health status and exercise was the strongest in Great Britain (.3502), and stronger than was the correlation in the U.S. (.2286). As respondents in both samples reported a positive relationship between high levels of participation in exercise and high levels of health status, one conclusion could be drawn in both countries--the importance of participation in exercise in maintaining high levels of health.

As expected, there was a negative correlation between health status and smoking both in Great Britain (-.1379) and in the U.S. (-.0436). While there was a positive correlation between health status and drinking in both the U.S. and Great Britain, it was stronger in the U.S. (.1820) than in Great Britain (.0482). In both countries, however, a large percent of respondents identified themselves as either non-drinkers (31% in Great Britain, 37.5% in the U.S.), or as light drinkers, having less than 17 drinks per month (38.4% in Great Britain, 39.1% in the U.S.). These positive correlations may reflect a change from no to light drinking, rather than to heavy levels of drinking and may suggest a non-linear relationship between the two variables. In both countries then, sample respondents reported negative correlations between smoking and levels of health status, and positive correlations between drinking and health status. The correlations in both countries between health status and the remaining independent variables of weight, diet, and sleep were weak.

Other than correlations between the dependent and independent variables, there were some similar correlations among independent variables. In both the U.S. and Great Britain there was a positive correlation between income and educational level: the correlation in the U.S. was, however, slightly stronger (.3844) than was the correlation in Great Britain (.3396).

After having analyzed the correlation matrices, two issues were resolved. Concern about multicollinearity in both sets of data between the variables of income level and educational level was resolved. In both data sets, it was determined that income and education each exerted an independent effect on the dependent variable. It was also decided that data used in future analysis would be at the most comparable levels of measurement--that is, the data set from each country would use four levels of the dependent variable, health status, eleven levels of income, and respondents aged 65 and over would be included in the analysis.

The comparison of the correlation matrices between countries revealed two interesting findings. First, the correlation between SES, as measured by income level, and health status was stronger in a country without an NHS than in a country with an NHS. The correlation in each country, .2662 in the U.S., and .1639 in Great Britain, was positive and significant at $p<.001$. However, correlation analysis does not show causation--whether one's level of health status affected one's income level, or one's income level affected one's health status. The next step in the data analysis was to describe the relationship between level of income and level of health status within each country and then to compare the within country relationships across countries.

Second, the correlations between levels of health status and levels of participation in exercise were found to be stronger in both countries than those between income and health status. It seemed possible that there were in fact variables other than SES, as measured by income level, which affected level of reported health status more significantly than SES. These relationships were explored in the second stage of data analysis.

Regression Analysis - United States

The first model presented in Chapter 4 was designed to see if there was a relationship between health status and level of income, if the relationship was linear in form (HEALTH = INCOME), and if there was improvement in the ability to predict a respondent's health status by knowing his or her level of income rather than by use of the mean of health status. The F-test was used to test how well the regression model fit the data. For this equation, $F = 2564.31$, and was significant at $p<.001$. Therefore, the levels of health status would vary in response to variations in socioeconomic status, and there would be an improvement in ability to predict health status by knowing a respondent's income level over use of the mean of health status. It is noted that the same results could be obtained by squaring the Pearson correlation.

The one independent variable, income, yielded an adjusted R^2 of .07. As would be expected by the use of only one variable, a very small portion of the variance in health status (7%) was explained. As can be seen in Table 5.10, Beta = .266, significant at $p<.001$. As expected, the Beta was positive, so in this sample, as income increased, there was a subsequent increase in reported health status.

While the first model (HEALTH = INCOME) was a good linear model to describe the relationship between health status and income, the use of level of income alone explained only a small portion of the variance in levels of

Table 5.10: Stepwise Regression of Health Status on Income, Education, Age, and Health Promotion Behaviors, United States

Variables	I	II	III
Income	.266***	.136***	.280***
Education		.162***	.163***
Age		-.280***	-.280***
Exercise		.218***	.361***
Smoke		-.050***	-.100***
Drink		.070***	.114***
Diet		.015**	.044***
Sleep		-.013**	-.013**
Inc*Exer			-.204***
Inc*Smoke			.056***
Inc*Drink			-.051***
Inc*Diet			-.038**
adj. R^2	.07	.25	.26

** $p<.01$ *** $p<.001$

health status. The second model (II) included the other theoretically defined independent variables: Level of education, age, and the health promotion behaviors of participation in exercise, moderate weight levels, diet, not smoking cigarettes, moderate rates of drinking and hours of sleep per night.

Table 5.10 presents the results of the test of model II (HEALTH = INCOME + EDUC + AGEYR + EXER + SMOKE + DRINK + WEIGHT + DIET + SLEEP). After completion of the stepwise selection process, model II included eight of the nine original theoretically defined independent variables. The "weight" variable did not meet the inclusion criteria, and was not entered into the model. For model II, $F = 1386.65$, it was significant at $p<.0000$, thus it was concluded that the relationship between health status and the set of independent variables was linear in form, and there was an improvement in the ability to predict a respondent's health status by use of this model rather than by use of the sample mean of health status. The adjusted R^2 of the model was .25 indicating that 25% of the variance in levels of health status was explained by use of the subset of independent variables in the model. The model II R^2 value (.25) demonstrates a substantial improvement in the ability to explain the variance in levels of reported health status over model I, where the $R^2 = .07$.

As can be seen in Table 5.10, the best predictor of health status in model II was age (-.280), significant at p<.001. Other significant (p<.001) predictors were exercise (.218), educational level (.162), level of income (.136), drinking (.070), and smoking (-.050). Diet (.015) and sleep (-.013) were significant at p<.01. In this sample, as participation in exercise, educational level, income level, rate of drinking, and likelihood of eating breakfast increased, reported health status increased. As age of respondent, smoking and hours of sleep increased, reported health status decreased. The negative relationships between health status and age, smoking, and increased hours of sleep were expected, as were the positive relationships between health status and levels of education and income, and diet. The positive relationship between health status and exercise was not unexpected, as the variables had been highly correlated, but the strength of the relationship was intriguing. The positive relationship between health status and drinking was also interesting, but as stated, most probably was indicative of a change from no drinking reported to light rates of drinking. In addition, this finding pointed to a possible beneficial effect of moderate rates of drinking on health status.

Inclusion of the additional independent variables into model II represented an improvement in the ability to predict a respondent's health status over use of only the variable income as used in model I. Model II revealed that there were three other variables (age, exercise, and level of education) that were better predictors of health status than was income. The variable weight was dropped from the model as it's value was not significant at $p<.01$.

The third model, which included variables for the interaction effects of income on the health promotion behaviors was then tested to determine whether the effects of the health promotion behaviors on health status differed significantly by level of income (HEALTH = INCOME + EDUC + AGEYR + EXER + SMOKE + DRINK + DIET + SLEEP + INC*EXER + INC*SMOKE + INC*DRINK + INC*DIET + INC*SLEEP). The results of the test of model III are presented in Table 5.10. For this model, $F = 961.46$, and was significant at $p<.001$. It was concluded that the relationship between the dependent variable and the subset of independent variables was linear inform, and there was an improvement in prediction by use of the independent variables over the mean of health status. The R^2 for this model was .26, higher than the R^2 for model II (.25), thus more of the variance in levels of reported health status was explained by model III with the inclusion of the interaction terms than by model II, without the interaction terms.

In model III, exercise was the best predictor of health status (.361), significant at $p<.001$. Other significant ($p<.001$) predictors were income (.280), age (-.279), the interaction of income and exercise--the lower the income level, the greater the impact of exercise on health status (-.204)--level of education (.162), drinking (.114), smoking (-.100), the interaction of income and smoking--the lower the income level, the greater was the impact of smoking on health status (.056)--the interaction of income and drinking--the lower the income level, the greater was the impact of drinking on health status (-.051)--and diet (.044). The interaction of income and diet--the lower the income level, the greater was the impact of eating breakfast on health status (-.038)--and sleep (-.013) were significant at p<.01. The variable demonstrating the interaction of income and sleep was not included in the model, as it was not significant at p<.01. From this analysis, it can be seen that the effects of the health promotion behaviors of participation in exercise, not smoking, moderate rates of drinking, and likelihood of eating breakfast on health status differed significantly by level of income. The health status of respondents at low income levels would be positively affected by participation in exercise, moderate levels of drinking, eating breakfast and reduction of or cessation of smoking. The most interesting finding of the test of this model was the significance of participation in exercise on health status, both directly, and as it mediated the negative effect of income on health status. This indicated that not only did participation in exercise result in higher levels of health, but that exercise would effect a positive impact on the health status of those with low income levels.

Model III, which included the interaction effects of income on the health promotion behaviors yielded a higher R^2 value (.26) than did model II, without the interaction terms (.25). The usefulness of including the interaction terms was further tested by use of a complete versus reduced model F-test. The result of this test was as follows:

$$F = \frac{(SSE_R - SSE_C)/(k-g)}{(SSE_C/[n-(k+1)]}$$

$$F = \frac{(17555.35-17382.08)/(15-9)}{(17382.08/[33630-(15+1)} = 55.34$$

The F-test statistic value was 55.34, which yielded an attained significance level of $p<.001$. There was evidence to conclude that the interaction terms were useful in the model. It was decided that model III was the most concise model which would make good prediction possible for this sample.

Regression Analysis - Great Britain

The first regression model tested using the data from Great Britain was the same as the first model tested using data from the U.S.: HEALTH = INCOME. The results of this first model (I) are presented in Table 5.11.

Table 5.11: Stepwise Regression of Health Status on Income, Education, Age, and Health Promotion Behaviors, Great Britain

Variables	I	II	III
Income	.164***	.095***	.246***
Education		.089***	.090***
Exercise		.331***	.469***
Smoke		-.109***	-.103***
Drink		.026**	
Sleep		.037***	.036***
Inc*Exer			-.223***
adj. R^2	.03***	.16***	.17***

** p<.01 *** p<.001

In order to determine how well model I fit the data the F-test was used. The F-value was 248.39, significant at p<.001, thus variation in level of health status was affected by variation in levels of SES. As can be seen in Table 5.11, the R^2 for this model was .03. While this first model was a good linear model to describe the relationship between health status and level of income, use of level of income alone explained only 3% of the variance in reported levels of health status. The Beta = .164, thus for every unit increase in income there was a corresponding unit increase of .164 in health status.

The second model (II) included the variables of level of education, age, and the health promotion behaviors of participation in exercise, not smoking, moderate levels of drinking and weight, diet, and hours of sleep. Table 5.11

presents the results of this model (HEALTH = INCOME + EDUC + AGEYR + EXER + SMOKE + DRINK + WEIGHT + DIET + SLEEP). For this model, F = 291.91, significant at p=.001. The linear relationship between health status and the set of independent variables was linear in form and there was an improvement in prediction with use of the equation over the sample mean of health status. The adjusted R^2 was .16 for the model, and indicated a significant improvement in the ability to explain the variance in the levels of reported health status than did model I ($R^2 = .03$).

As seen in Table 5.11, the best predictor of health status in this model was exercise, (.331), significant at p<.001. This relationship was not unexpected, as the correlation between the two variables had been strong, but it was interesting that is was the best predictor. Other variables significant at p<.001 were smoking (-.109), income (.095), level of education (.089), and sleep (.037). Drinking (.026) was significant at p<.01. The values for age of respondent, diet, and weight were not significant at p<.01, thus were not included in the model. In the British sample, as participation in exercise, level of income, level of education, hours of sleep, likelihood of eating breakfast, and rates of drinking increased, reported health status increased. As smoking and age of respondent increased, health status decreased. These relationships were all in the expected directions, based on the results of the correlation analysis. The result of testing model II revealed that participation in exercise was a better predictor of health status than was level of income.

The third model was tested in order to determine if the effects of the health promotion behaviors on health status differed significantly by level of income (HEALTH = INCOME + EDUC + AGEYR + EXER + SMOKE + DRINK + WEIGHT + DIET + SLEEP + INC*EXER + INC*SMOKE + INC*DRINK + INC*WEIGHT + INC*DIET + INC*SLEEP). The results of the test of model III are presented in Table 5.11. The relationship between health status and the set of independent variables was linear in form and there was an improvement in prediction by use of the set of variables as F = 260.36, significant at p<001. The R^2 for model II was .17, higher than the R^2 value in model II, which was .16. Again, the ability to explain the variance in levels of health status was improved in model III, which included the interaction terms.

As in model II, the best predictor of health status in model III was exercise (.469), significant at $p<.001$. Other variables significant at $p<.001$ were income (.246), smoking (-.103), level of education (.090), and sleep (.036). As participation in exercise, income level, educational level, and hours of sleep increased, health status increased, and as smoking increased, health status decreased. The strength of the relationship between health status and level of income was surprising and suggested that even though there was an NHS in Great Britain it had not diminished the positive effect that income had on health status. It was expected that this relationship would not have been significant, or it would have been weaker.

The variables drinking, age of respondent, weight, and diet, and the interactions of income and drinking, income and smoking, income and weight, income and diet, and income and sleep were not entered into model III as they were not significant at p<.01. The only interaction term significant in this model was that of income and exercise (-.223), significant at p<.001. This interaction term indicated that the effect of the health prevention behavior of participation in exercise on health status differed significantly by level of income: The lower the level of income, the greater was the impact of exercise on health status. The health status of respondents at low levels of income would be positiveely affected by participatin in exercise. This interaction term was a better predictor of level of health status than was level of education, smoking, or drinking. Only exercise and income were stronger predictors.

There were two interesting findings which resulted from the test of this model. First was the strength of the relationship between income and health status in this sample. The second was the strength of the both the relationship between exercise and health status, and with exercise as mediating the relationship between income and health status. These findings suggested that income continued to exert a significant influence on income in a country with an NHS, and the importance of participation in exercise in maintaining high levels of health, especially for those at low levels of income.

As was done with the data from the U.S., the necessity of including the interaction term was also tested by use of a complete versus reduced model F-test:

$$F = \frac{SSE_R - SSE_C)/(k-g)}{(SSE_C/[n-(k+1)]}$$

$$F = \frac{4768.34-4736.93)/(15-9)}{4736.93/[9003-(15+1)]} = 9.88$$

The F-test statistic value was 9.88, which yielded an attained significance level of $p<.001$. This F-test value, plus the fact that model III yielded a higher R^2 value (.17) than did model II (.16) allowed the decision to be made that the interaction terms provided useful information, and were needed in the model. It was concluded that model III was the most concise model possible that would make good prediction possible for this sample.

Comparison of the Regression Analyses

In both the U.S. and Great Britain, the models including the interaction terms were deemed the best models to describe the relationships between variables within that country. As such, they were the models used for comparison, allowing for the differences and similarities in relationships between the two countries to be discerned (Table 5.12). In comparing the models between the two countries, there were six variables which were shared that were good predictors of health status at p<.01, indicating similarities between the two countries. The variables were level of participation in exercise, level of income, the interaction of income and exercise, level of education, number of cigarettes smoked and hours of sleep per night. Another similarity was that there were three variables which were not significant in either data set--weight, and the interactions of income with weight and with sleep. Six variables were found to be significant predictors of health status in the U.S. that were not found to be significant in Great Britain, indicating differences between the two countries. They were age of respondent, drinking, diet (likelihood of eating breakfast), and the interactions of income with drinking, diet, and smoking.

While level of income was a good predictor of health status in both the U.S. and in Great Britain, the relationship between the two variables was stronger in the U.S. (.280, p<.001) than was the relationship between the two variables in Great Britain (.246, p<.001). The hypothesis of this study was therefore supported, as the relationship between SES and level of perceived health status was stronger in a country without an NHS (.280) than

Table 5.12: Comparison of Stepwise Regression Models, United States and Great Britain

Variables	United States	Great Britain
Income	.280***	.246***
Education	.163***	.090***
Exercise	.361***	.469***
Smoke	-.100***	-.103***
Sleep	-.013**	.036**
Inc*Exer	-.204***	-.222***
Age	-.280***	
Drink	.114***	
Diet	.044***	
Inc*Smoke	.056***	
Inc*Drink	-.051***	
Inc*Diet	-.038**	

** p<.01 *** p<.001

it was in a country with an NHS (.246). However, it was not expected that the strength of the relationships would be as similar as was found between the two countries. According to the theoretical perspective presented to explain differences between countries in describing the relationships between level of income and health status, it was expected that the differences in the relationships would have been greater than what was revealed by the data. Even though there is an NHS in Great Britain, which offers universal access to health care, with no financial barriers to restrict access to that care, income remained a significant positive predictor of health status. Therefore, it may be assumed that the ability to purchase health care, in a country with an NHS, would increase the level of health status, as it does in a country without a NHS. In these two samples, the increase in health status based on increase in level of income was, in fact, very similar.

An interesting finding of this study concerned the levels of health status reported by respondents in each country at the lowest levels of all measured variables (constant terms). In the U.S., the constant term was 1.88, and in Great Britain it was .92. According to the regression analyses performed in each country, those respondents reporting the lowest levels of all measured variables reported a higher level of health status in the U.S. than did the corresponding respondents in Great Britain. Since the return of level of income to level of health status was greater in the U.S. (.280) than in Great Britain (.246), the health status of respondents in the U.S., at each level of income, was higher than the health status of British respondents at the same income level. Further, not only did the British respondents who reported the lowest income level report lower health status than their counterparts in the U.S., but as level of income increased in each country, health status increased less than it did for respondents in the U.S. So while the hypothesis of the study was supported, the similarity in the health status-SES relationships between the countries and the lower level of health status reported by the British respondents at the lowest level of income indicated that the presence of the NHS in Great Britain has not served to produce healthier members of that society, based on level of income, than has the fee-for-service system of the U.S. In addition, income does remain a significant predictor of level of reported health status in Great Britain, even with the presence of the NHS; thus, the ability to purchase health care is related to level of health status.

Since there was a positive relationship between income and health status in a country with an NHS, and the level of health status for the poorest members of society in a country with an NHS was lower than the corresponding members in a country without an NHS, the conflict theoretical perspective which explains health status or outcome as a consequence of whether or not a country treats health care as a private good or public good, through the absence or presence of an NHS, may not be entirely satisfactory. If the conflict perspective, in conjunction with the findings of

the literature reviewed for this study were to offer a satisfactory explanation of the relationship between health status or outcome, based on system of health care delivery, it would be expected that while there would be a positive relationship between socioeconomic status and level of health status in Great Britain, the relationship between the two variables would not have been as similar as it was to the relationship found between the variables in the U.S.

While there was less variance in health status as a function of SES in Great Britain (.246) than there was in the U.S. (.280), the difference was very slight, especially considering the large sample sizes.

In addition, it would be expected that level of health status would be higher for respondents at the lowest level of income in Great Britain than in the U.S. It would be expected that universal access to health care, which theoretically presents no financial barriers to access care, would provide higher health status for the poorest members of the society than would a fee-for-service health care system which is based on ability to financially access that system. In this sample, ability to access the health care system without financial constraints did not equate to higher levels of perceived health status in Great Britain than in the U.S. There were other variables which in fact were found to more significantly affect health status in both countries.

Level of income was not the best predictor of level of health status in either the U.S. or Great Britain. In both countries, the health promotion behavior of level of participation in exercise was the best predictor of level of health status (.361 in the U.S.; .469 in Great Britain). In addition, the interaction of level of income and participation in exercise was a good predictor of health status in both countries (-.204 in the U.S.; -.223 in Great

Britain). Level of participation in exercise differed by level of income in each country. In both countries, the lower the income level of respondents, the grater was the impact of exercise on health status. This suggested that the health status of those members of both societies at the lower income levels would be positively affected by participation in exercise.

As expected, another similar finding between the two countries was the negative effect of smoking on health status (-.100 in the U.S.; -.108 in Great Britain). The interaction of smoking and income level on health status was significant in the U.S. sample (.056, $p<.001$), but not in the British sample. In the U.S., the lower the level of income, the greater was the impact of smoking on health status. This suggested that the health status of those at the lowest incomes levels would be positively affected if they would reduce that low income had on health status by reduce the number of cigarettes smoked, or stop smoking entirely. Hours of sleep was also a good predictor of health status in both countries, however the weakest predictor, significant at $p<.01$ in both samples. The direction of the relationship between hours of sleep and income level differed in the two countries. In the U.S., as hours of sleep increased, health status decreased (-.013) but in Great Britain as hours of sleep increased, health status increased (.036). The relationships were weak, and since in both countries almost all respondents reported between seven and nine hours sleep (71.2% in the U.S.; 84.6% in Great Britain), the change in hours of sleep did not vary far from this range.

The final variable that the countries shared as a good predictor of level of health status was level of education. In both the U.S. and Great Britain there was a positive relationship between level of education and health status (.163 in the U.S.; .088 in Great Britain, both significant at $p<.001$). The relationship was stronger in the U.S. than in Great Britain, but not as strong as the relationships between both exercise and income and health status in both countries. Some studies have found level of education to be the best predictor of perceived health status (Williams, 1990); however in this study it was not found to be the best, and, in fact, in both countries, level of exercise, level of income, and the interaction of exercise and income were better predictors of health status. A difference in this study may have been in the way variables were measured. In this study, health promotion behaviors were included in the analysis in addition to levels of education and income. In other studies, level of education may have implied a knowledge of healthy behaviors, but actual level of participation in the behaviors may not have been actually measured. In this study level of education and health behaviors were measured separately. While level of education may still have implied a knowledge of health behaviors in this study, the effect of each was measured separately. It may be that the inclusion of health promotion behaviors lessened the effect of level of education, thus there was a more sensitive measure of both variables (health promotion behaviors and level of education).

Age of respondent was a good predictor of health status in the U.S. sample (-.279, p<.001). It was a weak (-.02, p<.06) predictor in the British sample, and did not meet the inclusion criteria for the model described earlier. While beyond the scope of this study to explore reasons for these findings, it is intriguing. It may be that, even though income exerted a strong impact on health status in both the U.S. and Great Britain, the NHS may do a better job of protecting the elderly from poor health as income decreases with age. In the U.S., even with Medicare coverage, elderly Americans may be more vulnerable to decreases in income with age. Medicare still does require deductibles and co-payments, and does not cover all health care costs, which many elderly Americans may not be able to afford. With the NHS, elderly British would not have these costs.

Drinking was also a good predictor of health status in the U.S. sample (.114, p<.001), but not in Great Britain. In Great Britain, at the p<.02, level, it did not meet the inclusion criteria for the model. The interaction of drinking and income on health status (-.051) was also significant at p<.001 in the U.S. sample but was not significant in the British sample. As discussed earlier, 37.5% of respondents in the U.S. reported that they did not drink at all, and 39.1% reported they were light drinkers (less than 17 drinks per month), so the increase in level of drinking associated with level of health status was most likely indicative of a change in level from no drinking to light drinking, rather than to a heavy level of drinking which may suggest a non-linear relationship between the two variables. Therefore, the actual difference between the two countries may not reflect a meaningful difference in drinking behavior.

Diet, measured by the likelihood of eating breakfast each day, was a good predictor of health status in the U.S. (.044, p<.001). Respondents who reported that they ate breakfast almost every day had higher levels of health status than respondents who reported eating breakfast only sometimes or never. The interaction of diet and income on health status (-.038) was significant at p<.01. Thus, whether or not breakfast was eaten each day differed by level of income, and the lower the income level, the greater was the impact of eating breakfast on health status. As this variable did not meet inclusion criteria, it was not included in the model for Great Britain.

The findings of this study suggest that level of income is an important predictor of level of health status in countries both with and without an NHS. In addition, the health promotion behavior of participation in exercise was found to be the best predictor of health status in both samples. The interaction of level of income and exercise on health status suggested that the lower theincome level of respondents, the greater was the impact of exercise on health status. Level of education, number of cigarettes smoked, and number of hours of sleep per night were also found to be good predictors of health status in both samples. By having incorporated the health promotion behaviors identified by Belloc and Breslow (1972) and Berkman and Breslow (1983) into the analysis of the relationship between SES, as measured by income, and level of perceived health status, one is better able to understand the complex phenomenon of level of health status both within each country and across countries.

Having identified the predictors of perceived health status within each country and comparing them across countries, we return to the central issue of concern in this study: Would a structurally different system of health care delivery, the NHS of Great Britain, reduce discrepancies in health status by socioeconomic status found in the U.S. today? Would the institution of a health care system like the NHS improve the health status of all Americans? In the next chapter, attempts are made to answer these questions.

CHAPTER 6
ASSESSMENT AND IMPLICATIONS

The goals of this research study have been to examine the relationship between socioeconomic status and health status: (1) within a country without a national health service, (2) within a country with a national health service, and (3) to compare the relationships. It was anticipated that the results of this exercise would help determine if a structural change in the health care delivery system of the U.S. would provide better health care for Americans. In Chapter 2, the literature on health status, health promotion behaviors, and systems of health care delivery was reviewed, and a theoretical framework to guide the study was presented in Chapter 3. Chapter 4 contained the methodology for reaching the research goals, and Chapter 5 presented the results of the data analysis. In this chapter, the results of this study are compared to earlier empirical findings, the contributions of this study to the knowledge base are discussed, and directions for future research are pointed out.

Support for the Existing Empirical Literature

A major finding of this study was that there was a significant, positive relationship between SES, as measured by income level, and level of health status, as measured by perceived health status, in both the U.S. and Great Britain, and that the relationships were remarkably similar. The empirical literature reviewed for this study did indicate that, both in the U.S. and Great Britain, there would be a positive relationship between the two variables.

In the U.S., the literature showed that there was an inverse relationship between level of SES and mortality rates (Freund and McGuire, 1991). Those in the lower income groups were also reported to have higher morbidity rates than those in the higher income groups ("Health United States 1987", 1988; Satariano, 1986), higher disability rates (Statistical Abstracts of the U.S. 1991, 1991), and shorter life expectancies (House, 1981).

In Great Britain, Marmot et al. (1987) found that mortality rates differed by social class, with higher rates among the lower classes. Smith (1990) also reported that inequalities in morbidity and mortality existed in Great Britain which favored the higher classes. The findings in this study that there were significant, positive relationships between SES and health status in the U.S. and Great Britain supported the existing empirical research.

What had not been explored in the literature was a comparison of the relationship between SES and health status found within each country, in order to determine whether the relationship would be stronger in a country without an NHS.

The hypothesis of this study that there would be a stronger relationship between SES and health status in a country without an NHS than in a country with an NHS was derived from the literature and from the conflict theoretical perspective used in the study. The literature suggested that there would be a significant, positive relationship between SES and health status in both countries. The theoretical perspective employed proposed that the relationship would be stronger in a country without a NHS. In a country without a NHS, health care as a scarce resource is treated as a private good, subject to market forces, and becomes available to members of the society based on their ability to purchase the resource. In a country with an NHS, health care as a scarce resource is treated as a public good, and there is no competition on the market to acquire the resource. Availability of the resource to members of the society is not based on ability to purchase the resource. While the findings in this study supported the existing empirical research as reviewed, the conflict theory that was proposed to explain the discovered relationships was of limited use. While the relationship between SES and health status was greater in the U.S. than in Great Britain, the difference was so minimal that it can not be said that the theory offered an entirely useful explanation for the results obtained.

The empirical research reviewed in this study regarding the set of health promotion behavior variables was generally supported in this study. First of all, of the six health promotion behaviors included in this study that were identified by Belloc and Breslow (1972) and Berkman and Breslow (1983) as those which positively affected health status, only weight was not found to be a significant positive predictor of health status. Participation in exercise, not smoking, eating breakfast every day, sleeping seven to eight hours each night, and moderate alcohol use were found to be positive predictors of health status.

Berkman and Breslow (1983) found that the difference between engaging in no physical activity and even low rates of physical activity produced marked differences in mortality and morbidity rates. In a more recent study, Roberts and Brodie (1990) reported the health status of those who participated in physical activity to be significantly better than that of non-participators. As exercise was the most significant positive predictor of level of health status in both the U.S. and Great Britain in this study, the empirical research was strongly supported.

In addition to the findings of Belloc and Breslow (1972) and Berkman and Breslow (1983) that there was a significant negative association between smoking and health status, Thorlindsson et al. (1991) also reported a significant negative association between the two variables.

As smoking was negatively related to level of health status in both countries in this study, the literature reviewed regarding this association was also supported.

Although not well researched, seven to eight hours of sleep each night was found by Belloc and Breslow (1972) and Berkman and Breslow (1983) to be the optimal time for good health status. Kripke et al. (1979) also found that extremely long or short hours of sleep to be associated with mortality from heart disease, stroke, and cancer. Results of this study support these findings, as sleep was a good predictor of health status, with most respondents in both samples reporting between seven and nine hours sleep per night.

As did Belloc and Breslow (1972), this study also found a positive relationship between eating breakfast each day and level of health status, but only in the U.S. A positive relationship between drinking and health status was also reported only in the U.S. sample. While much of the empirical research reviewed in this study found a negative association between alcohol consumption and health status (Gill, 1986; Thorlindsson et al., 1991), Berkman and Breslow (1983) reported that moderate drinkers (17 to 45 drinks per month) had the lowest mortality rates, and better health status scores than did non- and heavy drinkers. The positive relationship between drinking and health status in this study, where most respondents who reported drinking did so at low levels, indicates some support for Berkman and Breslow (1983). Those who drank did report higher levels of health status.

As the interaction terms that were significant predictors of health status in the study revealed, there were differences in participation in some health promotion behaviors based on level of income. This was exemplified in both the U.S. and Great Britain, where the interaction of exercise and income was a significant predictor of health status, and in the U.S. where the interactions of income and smoking, drinking, and diet were significant. The interaction of income and exercise showed that, in both countries, participation in exercise would have a positive effect on health status, especially for those in the lower classes. In the U.S., drinking and diet would also have a positive effect on the health status of the members of the lower classes, as would decreases in smoking levels. Belloc and Breslow (1983) in the U.S., and Quine (1990) in Great Britain found that those in the lower classes were more likely to engage in high risk or adverse health behaviors. Cockerham et al. (1986) discovered that, in the U.S., those in the middle and upper classes participated more in healthy behaviors. For several of the health behaviors examined in this study (exercise, smoking, drinking, and diet) these empirical findings were supported.

The final goal of this research project was to compare the SES-health status relationships between a country with an NHS and a country without an NHS in order to evaluate whether the institution of an NHS in the U.S. would improve the health status of Americans. It was believed that there would be a relationship between the macro social structure of a society, as defined by system of health care delivery, and individual behavior or rates of behavior, as defined by health status. According to this perspective, the health status of the members of a society would vary according to the structural arrangement of the society designed to deliver health care, and an individual's position, or SES, within that society. A comparison of the relationship between SES and health status was made between the members of a society for which the structural arrangement of the health care system had created financial barriers to access the system (the fee-for-service system of the U.S.), and the members of a society for which financial barriers to access the system had been eliminated (the NHS of Great Britain). From the comparison of the SES-health status relationships between Great Britain and the U.S., it can not be concluded that the institution of an NHS in the U.S. would directly improve the health status of Americans. Using level of income as an indicator of SES, it was shown that the relationship between income and health status in the two countries was almost identical. Elimination of the financial barriers to access the health care system did not result in a meaningful reduction in the strength of the relationship between SES and health status in a country with an NHS as compared to a country without an NHS.

Contributing to the Knowledge Base

An important contribution to the knowledge base of sociology provided by this study was that it could not be concluded that a system of health care delivery which offers universal access to health care, eliminating financial barriers to health care services, would directly improve the health status of Americans. The facts that the relationships between SES and health status in Great Britain and the U.S. were so similar, and that the sample respondents in Great Britain who reported the lowest levels of income had lower levels of health status than their counterparts in the U.S. who reported the lowest income levels, lead to that conclusion.

From the results of this study, it can be concluded that engagement in health promotion behaviors by the members of a society positively affects their health status. Another contribution of this study was the discovery of the importance of exercise in creating good health. In both the U.S. and Great Britain, it was the most significant positive predictor of health status. The significance and strength of the interactive effect of exercise and income in both countries suggests that for those members who do have low income levels, exercise would exert a positive effect on their health status. It was also confirmed in this study that level of smoking negatively affected health status, and the interaction of smoking and income suggested that especially for Americans with low income levels, reducing or stopping smoking would have a positive effect on their health status.

Knowles (1990) argued that we need to take responsibility for our health by living healthy life styles. Former Secretary of Heath and Human Services Louis Sullivan (1991) reported that prevention of disease was the single most important factor in maintaining good health. To prevent disease Americans need to stop engaging in unhealthy behaviors, and start engaging in healthy behaviors. A healthier society can be created by its members living healthier lifestyles. Rather than engaging in high risk health behaviors, then paying the high costs of treating and curing the diseases caused by those behaviors, we should prevent the diseases from occurring in the first place. In the long run, health care costs would be reduced, because there would be a reduction in the costly treatment and cure of disease. The promotion of healthy lifestyle behaviors should be a priority item of those who are planning reform of our health care system. Promotion of exercise should be especially stressed.

An advantage of this study over others that have looked at the association between SES and health status is that this study included health promotion behaviors in the analysis. The finding in this study that level of participation in exercise was the best predictor of level of health status was not seen in any of the empirical research reviewed for this study. Previous research generally found either level of income or level of education to be the best predictor of health status; however, rates of participation in health promotion behaviors were not included in those studies.

There are some limitations of this study that should be mentioned. First of all, there are other phenomena that can affect levels of health status that were not measured. Environmental factors were not examined; nor were unhealthy living conditions. These could include toxic and hazardous environments in which people live, and non-hygienic living conditions. Genetic and biological factors which could also affect health status were not included.

Another limitation of this study concerned the composition of the samples. Respondents in both the U.S. and Great Britain included only those over 18 years of age, thus, children under 18 were not included. We know that one out of five children in the U.S. lives in poverty, thus children constitute a substantial portion of those living at the lowest income levels. A relationship between that substantial portion of members of the society and health status could not be ascertained in this study.

A third limitation of this study could be in the measurement of the dependent variable. In this study, self-perceived health status was used as the measure of health status. However, this researcher believes that this did not constitute a threat to the validity of the study. The work of several researchers (Cockerham et al., 1988; Harris and Guten, 1979; Thorlindsson et al., 1991) cited in this study used self-perceived health status as their measure of health status, and reported that self-reported health status was almost identical to objective health status as reported by physicians. As previously cited, many studies have found self-assessed health status to be the best predictor of health outcomes, and consistent with physician assessment.

Future Directions

Some of the findings of this research project have raised several questions that could not be dealt with in this study. One such question is why there is such a similar relationship between SES and health status in a country with an NHS and one without. Why, in Great Britain, where there is system that offers universal access to health care, does income continue to play an important role in affecting level of health status? Is it that the key issue is not level of income itself, but the lifestyles led by those members of the society who have lower income levels? If true, what is it about living in the lower classes that promotes less healthy lifestyles?

Kohn (1972) and McKinlay (1990) offer ideas which could be considered explanations, but it might also be interesting to look at Durkheims's theory of anomie to explain this phenomenon. Do members of the lower classes feel less connected to their social environment? There could be two consequences if this were true. First of all, because they feel less connected, do they care less about taking advantage of health care services available to them, and second, do they also care less about taking care of themselves? A question in the British data set asked if the respondent felt part of their community. There was a positive correlation between the response to this question (yes or no) and income level. As income level increased, likelihood of responding yes also increased. This would be an interesting avenue of research to pursue.

It may also be that members of the lower classes have less knowledge concerning healthy lifestyle behaviors. Assuming that increased level of education equates with increased knowledge of health promotion behaviors, then negative correlations between smoking and educational level in both data sets, and positive correlations between participation in exercise and educational level in both suggest this may be true. The correlations between income and exercise and income and smoking suggest that for those in the lower classes, participation in healthy behaviors (participation in exercise and not smoking) would positively affect their health status. However, there has been so much dissemination of knowledge concerning healthy behaviors in our society, especially regarding smoking, that one wonders whether some members of our society are simply ignoring the messages.

The interaction terms significant in the study suggest that those with lower incomes are more likely to smoke, which has a negative effect on health status, while those with higher incomes are more likely to engage in exercise, which has a positive effect on health. Might it be that these behaviors are both used as coping mechanisms, or stress reduction mechanisms, but that different behaviors are used by different groups? If so why? It would prove interesting to explore this possibility.

The relationships discerned between age and health status warrant further exploration. This study found that, in Great Britain, there was a weak, non-significant negative relationship between age and health status. In the U.S. there was a stronger, significant negative relationship. The study also found that there was a strong, significant negative relationship between age and income level in the Great Britain, one even stronger than in the U.S. Why older respondents in Great Britain, with decreased income levels, showed a non-significant decrease in health status in Great Britain is puzzling. It suggests that the NHS may protect the members from experiencing significant decreased levels of health status as they age and as income decreases. Another area of research to explore is the possibility that while an NHS may not increase the health status of its members compared to a fee-for-service system, it may, however, prevent a decrease in health status.

Conclusion

As pointed out in the beginning of this chapter, the goals of this research project were to examine the within country relationships between SES and health status in a country with an NHS and one without, then to compare those relationships. The relationships between SES and health status in both countries were remarkably similar. While the hypothesis of the study that the relationship would be stronger in a country without an NHS than with an NHS was supported, it was weakly supported. In this way, it would be determined whether or not the institution of an NHS would provide better health care, thus higher health status to Americans. It was concluded that it would be unlikely that an NHS would provide better health care, or higher health status to Americans. While many questions have been raised along the way, these goals have been met. In looking at past research studies, some differences, as well as similarities were found. Perhaps most important was the discovery of the significance of participation in health promotion behaviors, especially exercise, as affecting positive health outcomes, both directly, and also by mediating the negative effects of low level of income. Thus, the goals of the study have been met, important discoveries have been made, and interesting questions have been suggested.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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